LIBRARY
CGSC FT. LEAVENWORTH, KS

Cy 3

DEPARTMENT OF THE ARMY FIELD MANUAL — FM 38-746
MARINE CORPS ORDER — MCO P4030.24D
DEPARTMENT OF THE NAVY PUBLICATION — NAVSUP PUB 539
DEPARTMENT OF THE AIR FORCE PAMPHLET — AFJPAM 24-234
DEFENSE LOGISTICS AGENCY INSTRUCTION — DLAI 4145.6

LOGISTICS PACKAGING MANAGEMENT

OBSOLETE

HEADQUARTERS
DEPARTMENTS OF THE ARMY
UNITED STATES MARINE CORPS
UNITED STATES NAVY
DEPARTMENT OF THE AIR FORCE
THE DEFENSE LOGISTICS AGENCY

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.

FIELD MANUAL No. 38-746
MARINE CORPS ORDER No. MCO P4030.24D
NAVY PUBLICATION No. NAVSUP PUB 539
AIR FORCE PAMPHLET No. AFPAM 24-234
DEFENSE LOGISTICS AGENCY INSTRUCTION
No. DLAI 4145.6

HEADQUARTERS
DEPARTMENT OF THE ARMY
UNITED STATES MARINE CORPS
DEPARTMENT OF THE NAVY
DEPARTMENT OF THE AIR FORCE
DEFENSE LOGISTICS AGENCY
Washington, DC, 20 March 1998

LOGISTICS PACKAGING MANAGEMENT

CHAPTER **PAGE**

CHAPTER 1 - INTRODUCTION
PURPOSE AND SCOPE 1-1
RECOMMENDED CHANGES 1-1

CHAPTER 2 - PACKAGING WITHIN THE DEPARTMENT OF DEFENSE
BACKGROUND AND HISTORY OF PRESENT PACKAGING POLICY 2-1
DEPARTMENT OF DEFENSE PACKAGING POLICY 2-4
COMMERCIAL PACKAGING (ASTM D 3951) 2-5
LEVELS OF PROTECTION 2-5
WHAT DOD PACKAGING POLICY HAS ACCOMPLISHED AND WHAT IT EXPECTS TO ACCOMPLISH 2-6

CHAPTER 3 - PACKAGING WITHIN THE DEFENSE LOGISTICS AGENCY
DLA. IMPLEMENTATION OF DEPARTMENT OF DEFENSE POLICY 3-1
DLA PACKAGING ORGANIZATION 3-2

CHAPTER 4 - PACKAGING WITHIN THE ARMY
GENERAL PACKAGING POLICIES 4-1
ARMY PACKAGING ORGANIZATION 4-2

CHAPTER 5 - PACKAGING WITHIN THE AIR FORCE
GENERAL PACKAGING POLICY 5-1
AIR FORCE PACKAGING ORGANIZATION 5-2

CHAPTER 6 - PACKAGING WITHIN THE NAVY
NAVY PACKAGING POLICIES 6-1
NAVY PACKAGING BOARD 6-1
NAVY PACKAGING ORGANIZATION 6-2

CHAPTER 7 - PACKAGING WITHIN THE MARINE CORPS - ADVANTAGES OF AUTOMATIC DATA PROCESSING
MARINE CORP PACKAGING POLICIES 7-1
MARINE CORPS PRESERVATION, PACKAGING, AND PACKING (P3) COMMITTEE 7-1
ESSENTIAL EXTERNAL PACKAGING RELATIONSHIIPS 7-4

CHAPTER 8 - ACQUISITION
ACQUISITION OF PACKAGING 8-1
THE FUNCTION OF THE PACKAGING SPECIALIST IN ACQUISITION 8-6
PACKAGING COST ANALYSIS 8-7

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.

*This publication supersedes FM 38-746, 11 August 1988.

CHAPTER PAGE

CHAPTER 9 - CONTRACT ADMINISTRATION
PACKAGING SPECIALIST'S RESPONSIBILITIES IN CONTRACT ADMINISTRATION 9-1
DEFENSE CONTRACT MANAGEMENT COMMAND 9-3

CHAPTER 10 - QUALITY ASSURANCE OF PACKAGING
TESTING AND PROVING 10-1
ROLE OF THE PACKAGING SPECIALIST IN ASSISTING QUALITY ASSURANCE 10-5

CHAPTER 11 - VALUE ENGINEERING
APPLICATION OF VALUE ENGINEERING IN PACKAGING DEFINED 11-1
VALUE ENGINEERING IN ACQUISITION 11-4
APPLICAITON OF VALUE ENGINEERING TO PACKAGING 11-5

CHAPTER 12 - TRANSPORTATION AND PACKAGING
EFFECTS OF PACKAGING ON TRANSPORTATION CHARGES 12-1
EFFECTS OF MODES OF TRANSPORTATION ON PACKAGING 12-7
TARE WEIGHT AND CUBE REDUCTION 12-10
PACKAGING IMPROVEMENT PROGRAM 12-11
EFFECT OF MILSTRIP AND MILSTAMP ON PACKAGING 12-13

CHAPTER 13 - STORAGE AND PACKAGING
FUNCTION OF STORAGE AND ITS RELATION TO PACKAGING 13-1
THE CARE OF SUPPLIES IN STORAGE PROGRAM (COSIS) 13-4
PACKAGING LINE LAYOUT 13-5
QUALITY ASSURANCE IN THE DEPOT 13-9
AUTOMATED MARKING AND MATERIALS HANDLING 13-11

CHAPTER 14 - PACKAGING STANDARDIZATION
DEPARTMENT OF DEFENSE STANDARDIZATION BACKGROUND 14-1
STANDARDIZATION IN PACKAGING 14-3

CHAPTER 15 - APPLICATION OF AUTOMATIC DATA PROCESSING SYSTEMS (ADP) TO PACKAGING
ADVANTAGES OF AUTOMATIC DATA PROCESSING 15-1
THE APPLICATION OF ADP TO PACKAGING 15-1
CODING SYSTEMS 15-1
CURRENT SYSTEMS 15-2

CHAPTER 16 - GENERAL SERVICES ADMINISTRATION SUPPORT TO MILITARY PACKAGING
ORGANIZATION AND FUNCTIONS 16-1
ROLE AND MISSION 16-2
FEDERAL SUPPLY SERVICE (FSS) - AN OVERVIEW 16-4
SUPPORT TO THE MILITARY 16-6

CHAPTER 1

Introduction

PURPOSE AND SCOPE

This manual contains information on packaging management and its implementation by the Army, Navy, Air Force, Marine Corps, and the Defense Logistics Agency. It is published for use as an official document to support operations and the training of individuals and units of the Armed Forces. It is based on policy and doctrine issued by the Defense Logistics Agency and the various services. It is intended to improve management responsibilities in regard to packaging administration matters.

This manual covers one of the elements of the science of logistics. Packaging, in its broadest sense, is that element which enhances handling in shipment and storage and provides life cycle protection to material from point of origin to the ultimate use. It also provides protection during return or disposal. Packaging is a factor in all the other logistics elements and is affected by procurement, contract administration, quality assurance, transportation, and storage. The subject is developed in this document.

RECOMMENDED CHANGES

Users of this publication are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the specific page, paragraph, and the line of the text in which the change is recommended.

A review will be given to each comment to ensure understanding and complete evaluation. Comments should be prepared using DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded to Dean, School of Military Packaging Technology, ATTN: ATSL-MP, 360 Lanyard Road, Aberdeen Proving Ground, MD 21005-5003.

CHAPTER 2

Packaging Within the Department of Defense

BACKGROUND AND HISTORY OF PRESENT PACKAGING POLICY

The lexicographers have defined "logistics" as "the branch of military science concerned with the mathematics of transportation and supply and the movement of bodies of troops." Others include the quartering of troops in their definitions. In the narrow sense of these definitions, then, a logistician is primarily concerned with quantities, distances and time. In other words, how many and what kind of vehicles, weapons, repair parts and supporting equipment will a body of troops require for a module of time. Other problems the logistician has to solve are how will the troops be sheltered and how much subsistence will be required.

Supply is one of the prime logistical functions. The problems involved here are not only how many or how much of each item will be required; but also, when will the materiel be used, where will it be stored, and how will it be moved. It is in these areas that the logistical functional manager must of necessity concern himself with the importance of packaging and be sure that qualified specialists are doing this work.

If an effective body of troops is to be adequately supported, all items of supply must be delivered to them in ready-for-use condition. Broken, rusted or otherwise deteriorated materiel supplied to the unit represents a waste of money, manpower, transportation and storage facilities; and results in reducing the effectiveness of the troop unit.

Adequate protective packaging, using approved materials applied in accordance with prescribed methods, will reduce to a minimum losses which are due to breakage and deterioration. Austere funding and budget restrictions have often resulted in a reduction of packaging protection applied to items of military supply. Such actions may well be termed "penny wise and pound foolish." Saving a dollar in packaging costs, only to lose a ten, twenty or thousand dollar item as a result, is the epitome of financial irresponsibility.

The objective of the military in the packaging function is to provide adequate protection at the minimum cost. The emphasis in implementing this policy must be on the adequate protection, with cost factors being secondary in importance.

What value is there in moldy bedding, inedible subsistence and rusted or broken repair parts other than the lowering of morale and the resultant ineffectiveness of the troop unit? Is this the pay-off we are looking for when we buy or condone inadequate packaging protection in the name of Cost Reduction? Don't sell packaging short! It is the Keystone of the Logistics supply system. Without adequate packaging the system would fall apart.

The packaging specialist who is concerned with protection of the item must stay abreast of all new packaging developments in order to successfully achieve the mission assignment. The packaging specialist must work closely with transportation and storage specialists and procurement personnel to make certain that proper, adequate packaging is required by the contract, and that the packaging is designed to withstand the hazards of the known or anticipated transportation and storage environments.

The same holds true in the case of materiel shipped from depot stock. What may appear to be adequate protection in the confines of the CONUS depot warehouse may be grossly inadequate protection when the packs are shipped to overseas destinations.

One of our chief concerns in supplying the troops is "reliability." A weapon must fire, a vehicle operate and a computer function as soon as it is placed into service. We build reliability into our systems -- let us not lose it in the packaging department.

Everyone concerned with supply should adopt the attitude that the security of the nation may be wrapped in the container being designed, the package being fabricated, or the box being handled.

GENERAL HISTORY AND POLITICAL BACKGROUND

From the days of the Colonies and the Revolutionary Army until our entry into World War II, no special emphasis was placed on packaging our military supplies and equipment.

Oiled paper, oiled silk, grease, and, in the years between World War I and World War II, a compound known as cosmoline, were about the only barriers between our materiel and its environment.

In the area of containers, the nailed wood box and the crate were relied upon almost exclusively.

Our relatively short supply lines during wars that were fought within our continental limits, and the negligible amount of storage during the periods between wars did not demand the creation of a packaging technology more sophisticated than had been developed by commercial interests.

After World War I, the War Department was faced with great quantities of surplus arms, ammunition, and other equipment; and some research was done on the prevention of corrosion, and many of our stored weapons were protected by the application of cosmoline.

Immediately after our entry into World War II, with supply lines stretching halfway around the globe, our combat leaders and supply officers were shocked by the fact that less than half our materiel was arriving in usable condition. Extreme storage conditions and rough handling of materiel through our supply lines, especially on the Pacific islands, resulted in further deterioration before the frontline troops could be provisioned. Also adding to the confusion was the receipt of shipping containers not identifying their true contents due to lack of proper marking.

Research on corrosion prevention and studies in packaging technology and containerization that had been progressing slowly in the peacetime years were accelerated. Specifications on packaging materials were developed concurrently with packaging specifications and manuals of instruction on the selection, application, and use of these specialized materials, containers, and techniques.

The Army and Navy immediately sponsored programs of research and development in packaging. With the cooperation of industry and civilian agencies of the Government (such as the Forest Products Laboratory), training programs for personnel engaged in packaging were established.

As a result of this concerted effort by all military and civilian agencies and industry, at the end of World War II our deterioration rate of military supplies in the provisioning pipeline was cut down to less than 5 percent.

The victorious end of World War II again brought a flood of surplus materiel into our ports and depots. At the same time, large numbers of military personnel with some training in packaging were released from the Armed Forces and the depots, faced with reduced budgets, were forced to cut back their civilian staffs.

Many new procurements made during this period specified commercial packaging even though the materiel was destined for storage. This was evidently done in order to save procurement dollars, with no thought of future consequences.

Consequently, a great quantity of unprotected or improperly packaged materiel found its way into our military warehouses.

When our troops were sent into Korea as part of the United Nations Forces, we found that a large percentage of the materiel and equipment that had been stored during the 1947-50 period had deteriorated and portions were unsalvageable.

Concurrently, with the growth of preservation and packaging problems in our standard hardware, the introduction into the supply line of items and equipment made wholly, or in part, of the "exotic" metals, such as magnesium, magnified the overall problem of affording adequate protection to our materiel.

It was determined that positive steps would have to be taken to insure that money and materiel would no longer be wasted because of inadequate and improper packaging.

ACTION OF THE CONGRESS

The office of the Secretary of Defense was established by Public Law 436, 82d Congress, which has been codified as chapter 145, Title 10, United States Code. This act details the duties of that office, among which is the responsibility for insuring that military materiel is adequately protected against damage and deterioration during handling, shipment, and storage.

As one of his acts in fulfilling the duties of his office, the Secretary of Defense, in July 1955, issued Department of Defense Instruction 4100.14,

which instructs the military services in the basic policy for the uniform packaging and marking of items of military supply.

The Instruction has been revised several times over the years. It has been replaced by DOD 4140.1-R, DOD Materiel Management Regulation.

The DOD 4140.1-R is issued under authority of DOD Directive 4140.1, "Materiel Management Policy," January 4, 1993, and DOD Instruction 4140.60, "DOD Materiel Management," January 5, 1993. It provides guidance for the uniform management of DOD materiel and cancels the DOD issuances authorized for cancellation by the materiel management Directive and Instruction. The policies contained in this regulation reflect the efforts of the Military Services, Defense Logistics Agency, and the Office of the Deputy Assistant Secretary (Logistics) to revise over 40 DOD issuances on various aspects of materiel management policy. The revisions reflect:

- A change in anticipated military threat, with corresponding effects on requirements and inventories,
- Better business practices for more effective use of materiel to meet customer requirements, including recommendations of the General Accounting Office and the DOD Inspector General.

DEPARTMENT OF DEFENSE PACKAGING POLICY

The DOD Materiel Management Regulation establishes policies and criteria for use by Department of Defense components in developing uniform regulations governing the preservation, packing, and marking of items of supply to assure their protection from deterioration and damage during shipment, handling, and storage from time of original purchase until used.

The joint regulation, AR 700-15/NAVSUPINST 4030.28D/AFR 71-6/MCO 4030.33D/DLAR 4145.7 titled, Logistics Packaging of Materiel, implements DOD 4140.1-R, Chapter 5. This regulation, which applies to all DOD components along with MIL-STD-2073-1, Standard Practice for Military Packaging, outlines the DOD packaging policy.

The levels of protection are redefined in MIL-STD-2073-1. The levels of protection are a means of specifying the level of military preservation and packing that a given item requires to assure that it is not degraded during shipment and storage. The military levels of protection will be discussed later in this chapter.

MIL-STD-2073-1 outlines standard processes for the development and documentation of military packaging, as distinct from commercial packaging. This standard covers methods of preservation to protect material against environmentally induced corrosion and deterioration. physical and mechanical damage, and other forms of degradation during storage, multiple handling, and shipment associated with the military distribution system.

For purposes of MIL-STD-2073-1, military distribution system is defined as the process(es) by which materiel, not intended for immediate use, is stored and/or moved within or between DOD facilities.

The requirements of this standard shall only be applied to the packaging of items that are expected to enter the military distribution system. Items not going into stock shall be packaged in accordance with standard commercial practice as defined in ASTM D 3951. Items not covered by this standard include, but are not limited to, the following:

- Items intended for immediate use
- Items for not mission-capable supply
- Items intended for depot operational consumption
- Small parcel shipment (CONUS), nor-for-stock
- Direct vendor deliveries (CONUS)

Exceptions to the above criteria are items intended for delivery-at-sea, items delivered during wartime, or items requiring reusable containers.

COMMERCIAL PACKAGING (ASTM D 3951)

ASTM D 3951 provides the minimum requirements for commercial preservation, packaging and marking. These requirements provide for physical and mechanical protection and allow for multiple handling and shipment by any mode and storage for at least one year in favorable conditions without damage to the packaged item.

These requirements parallel military packaging requirements in that many of the same steps must be taken in order to construct the unit pack, etc. However, commercial packaging in accordance with ASTM D 3951 does not require nor preclude the use of military and Federal specification materials or methods. In fact, advanced packaging technologies are encouraged.

LEVELS OF PROTECTION

MILITARY LEVEL OF PRESERVATION

Military preservation is designed to protect an item during shipment, handling, indeterminate storage, and distribution to consignees worldwide.

MILITARY LEVELS OF PACKING

Level A

Level A packing is the protection required to meet the most severe worldwide shipment, handling and storage conditions. A level A pack must, in tandem with the applied preservation, be capable of protecting material from the effects of direct exposure to extremes of climate, terrain, and operational and transportation environments.

Examples of situations which indicate a need for use of a level A pack are:

- war reserve material;
- mobilization;
- strategic and theater deployment and employment;
- open storage; and
- deck loading.

Examples of containers used for Level A packing requirements include, but are not limited to, overseas type wood boxes and plastic and metal reusable containers.

Level B

Level B packing is the protection required to meet moderate worldwide shipment, handling, and storage conditions. A level B pack must, in tandem with the applied preservation, be capable of protecting material not directly exposed to extremes of climate, terrain, and operational and transportation environments.

Examples of situations which indicate a need for use of Level B pack are:

- security assistance, e.g., Foreign Military Sales (FMS) and
- containerized overseas shipments.

Examples of containers used for Level B packing requirements include, but not limited to

- domestic wood crates:
- weather-resistant fiberboard containers.
- fast-pack containers;
- weather-resistant fiber drums; and
- weather-resistant paper and multi-wall shipping sacks.

WHAT DOD PACKAGING POLICY HAS ACCOMPLISHED AND WHAT IT EXPECTS TO ACCOMPLISH

Prior to the promulgation of the first Department of Defense Instruction 4100.14 on preservation, packing, and marking of items of military supply, there had been no central authority to establish guidelines for the services on these subjects. Each of the services developed its own philosophy, concepts, and policy concerning the protection of materiel in the supply pipeline.

There existed some close areas of cooperation as evidenced by the Joint Army-Navy (JAN) specifications on packaging processes and materials developed during World War II. However, even staying within the general limits spelled out by these joint documents, each service headed in its own direction, influenced by its special problems in its own sphere of operations.

This generated many problems for our suppliers who were confused by differing prescriptions for the same common item procured by the several technical services of the Army, and perhaps also by several of the Bureaus and offices of the Navy and by the Air Force.

Department of Defense 4140.1-R is not a panacea--it does not cure all these illnesses in our system overnight. It was not intended to do so. By staying within the guidelines and implementing this Instruction with their own regulations and directives; however, the services started on converging roads in the field of packaging which have only recently begun to merge into the unified concept of similar packaging for similar items.

Persistent efforts in the areas of packaging standardization, reduction of tare weight and cube, and more intensive research and development in packaging materials and techniques have begun to pay off in overall cost

reductions and cost avoidances. Packaging cost standards have been developed to provide the procurement and contract administration offices with a basis negotiation. The inclusion of value engineering and incentive clauses in contracts has also contributed to improved packaging materials and techniques at reduced costs through cooperation between the military and industry.

FUTURE EXPECTATIONS

The ideal pack has been described as one having no tare weight, no more cube than the item itself, no cost, and packaging materials and techniques at reduced costs through cooperation between the military and industry. Although this goal is idealistic; packaging technology and materials are striving toward this end .

Packaging standardization projects are bringing more uniformity into our packaging prescriptions. Current studies involving both containerization and load unitization and modes of transportation emphasize the interdependence of these two elements of the science of logistics to assure timely, reliable provisioning of our combat elements.

Our packaging program provides highly reliable protection at a lower cost. This packaging is easily handled resulting in less expenditure of transportation funds. This has been accomplished through packaging standardization, research and development, and implementation of the Department of Defense packaging policies.

CHAPTER 3

Packaging Within the Defense Logistics Agency (DLA)

DLA. IMPLEMENTATION OF DEPARTMENT OF DEFENSE POLICY

Department of Defense Regulation 4140.1-R is implemented by DLA in DLAR 4145.7--a joint military Service/DLA publication.

It is applicable to Headquarters, DLA, and the Defense supply centers, depots, service centers, having a logistical mission for DLA-managed items of supply, and the Defense Contract Management Command (DCMC) (Fig. 3-1)

Under the provisions of this regulation Commanders of supply centers:

- Assure that materials and procedures prescribed by appropriate standards and specifications are utilized in invitations for bid, contracts, and other purchase documents. Procedures will be stated in sufficient detail to preclude interpretation which may result in excessive, costly, or unessential materials and processes in completion of the package.
- Implement the policies and objectives of this DLA regulation, affording attention to--
  - o The development and periodic review of preparation for delivery requirements for timely inclusion in specifications, standards, and other applicable documents.
  - o Conservation of manpower, material, and money.
  - o The development of uniform requirements utilizing a minimum of kinds, sizes, and types of packages and packaging techniques.
  - o Cooperation with industry.
  - o Development of data which will provide experience needed for more economical application of levels.

Commanders of depots develop local procedures and controls to assure performance and accomplishment of preservation and packing functions in the most economical manner within the policies, objective, and guidelines established in the regulation.

The DLA's 4145.7 shows that this agency has fully implemented the Regulation 4140.1-R issued by the Department of Defense. It emphasizes the employment of the least costly levels and methods of packaging which will provide required protection.

Items awaiting disposal as salvage, excess, obsolete, or surplus will be afforded only such preservation, packaging, and packing which may be required to retain the item in the condition existing at the time disposition action was determined.

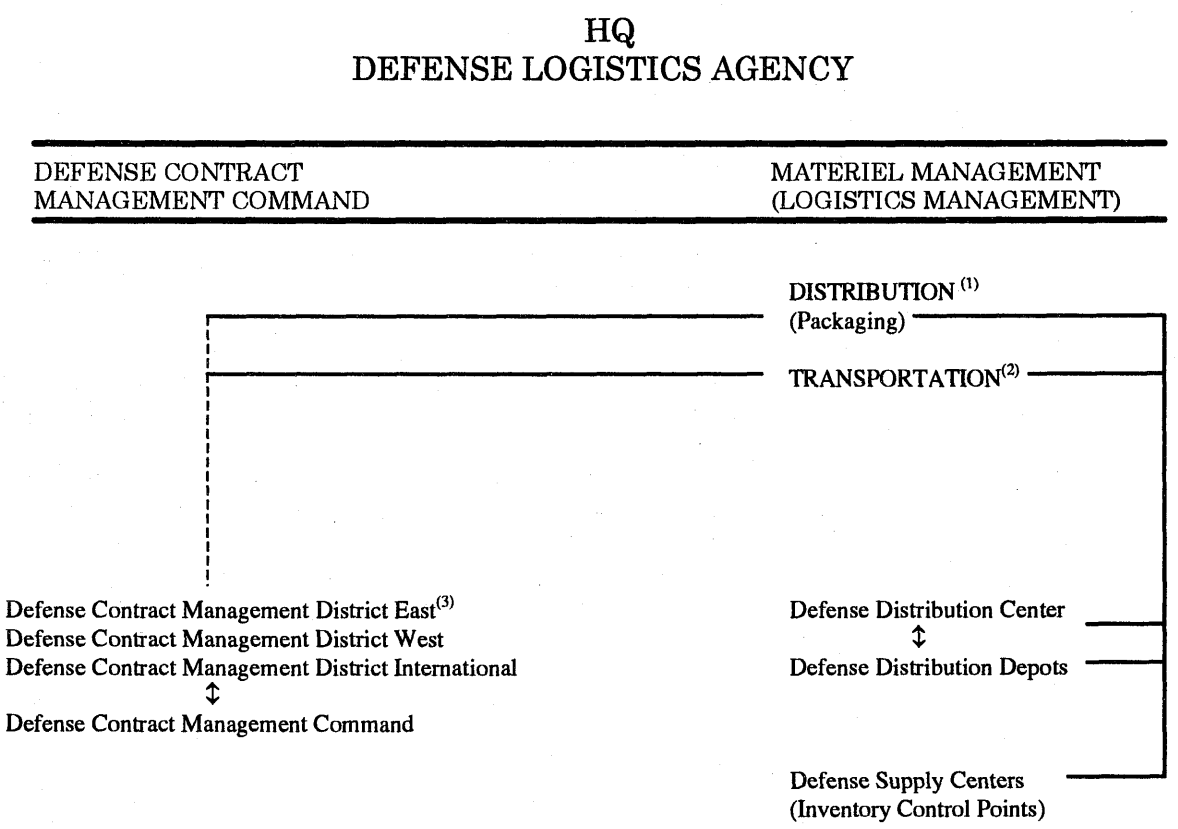


Figure 3-1

(1)MMLDD provides matrix packaging management program support to all DLA headquarters elements (including DCMC) and DLA field activities.

(2)MMLDT provides matrix transportation management support to all DLA headquarters elements (including DCMC) and DLA field activities.

(3)DCMDE provides "lead agent" transportation and packaging support to all DCMC field offices. Both Districts retain operational responsibilities for their respective geographic areas.

Unserviceable, economically repairable items, held in storage awaiting shipment to a repair facility or awaiting repair, will be afforded only such preservation, packaging, and packing which may be required to retain the item in the condition existing at the time of receipt and to prevent further deterioration or damage due to the hazards to which they may be subjected during shipment, handling, and storage.

DLA PACKAGING ORGANIZATION

HEADQUARTERS, DLA

Headquarters packaging policy resides in Materiel Distribution, Logistics Policy, which has responsibility to provide support to the Defense Supply Centers, Distribution Depots and the Defense Contract Management Command elements. It--

- Develops policy, criteria, methods and procedures; and administers the preservation, packing, and marking program for the acquisition receipt, storage, and preparation for delivery of DLA-managed materiel.
- Acts as the DLA focal point and represents DLA with DOD, the Military Departments, other Federal agencies, and industry, on preservation, and packing matters including membership to the DOD advisory Group for the School of Military Packaging Technology, the Defense Packaging Policy Group (DPPG), other boards, and committees.
- Assists Defense Supply Centers (DSC) technical operations in obtaining and utilizing engineering support services for the research and development and preservation and packing of DLA-managed materiel.
- Administers the program for preparation, review, coordination, maintenance, and custody of specifications and Military and Federal standards for preservation and packing of DLA-managed items. Maintains liaison with Government, industry, and industrial associations in coordinating industrial/commercial standards with Military Departments.
- Recommends standards for qualifications, training, and indoctrination of professional, technical, and supervisory employees concerned with storage and materials handling operations at DLA-managed activities.
- Monitors the development of Certification of Equivalency (COE) when military packaging does not meet the exact specification of the Department of Transportation.
- Establishes DLA packaging goals and objectives, as required.
- Operates the DLA Packaging Board as outlined in DLAD 4145.12.

Headquarters DLA is responsible for the following functions:

- Advises the Executive Director on transportation, traffic management and packaging policies, plans and functions. Promotes DOD packaging and traffic management policy objectives of uniformity, economy and effectiveness.
- Alerts the DCMC transportation and packaging of its mission. Initiates implementing procedures for DCMC transportation and packaging operations.
- Provides guidance to DCMC field activities on transportation, traffic management and packaging matters relating to contractor methods and procedures.
- Furnishes DCMC field activities technical advice on interpretations of contractual provisions in Army, Navy, Air Force, DLA and National Aeronautics and Space Administration (NASA) contracts assigned for administration. Develops procedures to be followed in implementing the contractual provisions.
- Establishes requirements and coordinates specialized traffic management and packaging training programs for DCMC activities and contractor personnel. Assists in development of specialized training courses.
- Provides focal point with contractors, carriers, NASA components, Military Departments and other Government agencies in all matters

involving DCMC transportation, traffic management and packaging management program matters.

- Maintains liaison with other DOD components and other Government and nongovernment agencies in all matters pertaining to transportability of material with particular emphasis on hazardous materials. Provides guidance on transportability to DCMC field activities.

DEFENSE SUPPLY CENTERS (DSC's)

Each DSC has the responsibility for preservation, packing, and marking of the materiel for which it has cognizance. It--

- Provides technical preservation and packing support to the contracting officer.
- Reviews procurement requests for technical adequacy of preservation, packing, and marking provisions.
- Determines/coordinates preservation, packaging and quantity unit pack requirements for DLA managed items. Resolves unit of issue discrepancies/conflicts as required.
- Provides computer input into the Contracting Technical Data File or Defense Integrated Subsistence Management System, as applicable for preservation and packing requirements of DLA managed items.
- Participates, as requested by the quality element, in preaward surveys for technical packaging support.
- Performs technical visits to manufacturers' plants to determine state-of-the-art technical packaging processes in order to harmonize commercial/industrial packaging capabilities with DOD packaging requirements.
- Serves as the packaging point of contact for Contract Review Office.
- Reviews and provides technical recommendations to the quality element on all requests for waivers or deviation to technical packaging requirements.
- Determines necessity for preparing Special Packaging Instructions (SPI). Requests Military Services' development of SPI's, as appropriate.
- Researches, ensures resolution and takes corrective action on reports of packaging discrepancies forwarded from the quality element.
- Determines needs and initiates action for special projects, including laboratory test support from the Military Services or other Services, to evaluate proposed improvements in the packaging of DLA managed items.
- Provides technical guidance and support to storage and maintenance activities on packaging matters.
- Maintains cooperative liaison with DLA Headquarters and Primary Level Field Activities, Military Services, and other Government agencies regarding packaging matters.
- Participates in the DLA Packaging Board per DLAR 4145.40.
- Ensures that packaging awareness is included in all Center Orientation Briefings for newly assigned personnel.

DEFENSE CONTRACT MANAGEMENT COMMAND (DCMC)

At the DCMC level, contract administration packaging responsibilities are assigned to the transportation and packaging components, and Quality

Assurance personnel. Inspection and acceptance of contractor packaging services are performed by DMCM Quality Assurance. It--

- Participates in the DLA Packaging Board per DLAR 4145.40.
- DCMD East assumes responsibilities regarding Lead Agent for packaging support for District West and International.
- Performs Staff Assistance Visits (SAV's).
- Develops, administers, and instructs various training programs and workshops.
- Assists HQ and other DOD commands in establishing and promoting various programs, i.e. Stock Readiness and ROD programs.

The transportation and packaging component's function are:

- Develops internal procedures within the guidelines established by HQ DLA for performance of transportation, traffic management and packaging functions by transportation and packaging elements of DCMC's.
- Develops, implements, and monitors DCMD packaging cost reduction program to ensure that conservation of funds Is accomplished without sacrificing necessary protection: strives to reduce weight and cube.
- Provides a review and approval of contractor-prepared packaging/materials handling data and design drawings as required by contractual documents.
- Participates in preaward surveys, capability reviews, and contractors' estimating methods and procurement systems reviews.
- Recommends actions, to procuring activities, to promote uniformity and economy of packing/materials handling techniques, material and methods.
- Supports damage prevention control programs of other Government activities; develops, implements, and monitors the DCMD damage prevention control programs, i.e., ROD, astray freight, and Stock Readiness programs.
- Provides technical assistance to contractors in their preparation of Defense Industrial Production Equipment and Government-furnished property for shipment and storage.
- Reviews and evaluates contractor's packaging/materials handling price and cost proposals on individual procurement.
- Maintains an awareness of all improvement programs and developments in the packaging field.
- Instructs training programs/workshops/seminars to in-house and contractor personnel when requested or as required.
- Reviews contacts for packaging data to ensure completeness and accuracy of technical data and recommended specifications.

The Technical Support Division, Quality Assurance Directorate's functions are as follows:

- Develops internal procedures within the guidelines established by HQ DLA to assure accomplishment of the quality assurance program and performs staff supervision region-wide for preservation, packing and marking.

- Investigates, coordinates and resolves major quality problems with the procuring and receiving activities.
- Provides technical and engineering staff assistance in packaging for the Director of Quality Assurance and region filed components.

At DCMCs:

- Transportation and packaging component functions are accomplished by performing transportation, traffic management and packaging functions in accordance with regional procedures.
- Quality Assurance Office functions are--
  - o Evaluates and performs surveillance over the contractors' systems and procedures in the area of preservation, packing, and container marking to assure conformance with contractual requirements.
  - o Investigates quality deficiency reports; assures that corrective and preventive actions are taken.
  - o Coordinates with packaging specialist as necessary.

DEFENSE DEPOTS

At the six defense depots, packaging management responsibilities are assigned to the Director of Distributions, Distribution Management Division and Production Control Branch.

The depot packaging management functions control and coordinate packaging of materiel for the Distributions Directorate. In this capacity the depot packaging management--

- Provides technical direction, advice and policy guidance to Directorate elements on packaging management, including the functions of preservation, packing, crating, box fabrication, marking and unitization/palletization.
- Provides accredited off-campus instruction of military packaging technology courses to Directorate elements.
- Develops and maintains the packaging portion of the depot master replacement plan for obtaining, updating and replacing packaging equipment and systems.
- Develops and implements the depots' use of new packaging materials, containers and processes to increase work productivity.
- Schedules and conducts periodic surveillance reviews of depot packaging in receiving, warehousing, and stock maintenance functions to evaluate the effectiveness of those packaging operations an direct changes to improve operational effectiveness.

- Schedules and conducts periodic surveillance reviews of depot packaging in receiving, warehousing, and stock maintenance functions to evaluate the effectiveness of those packaging operations an direct changes to improve operational effectiveness.

Chapter 4

Packaging Within the Army

GENERAL PACKAGING POLICIES

Army Regulation AR 700-15, Logistics Packaging of Materiel, is the implementation of Chapter 5 of DOD 4140.1-R. This document reflects the basic packaging policies of the Department of Defense as well as the Army's definition of areas of responsibility for the determination of the levels of packing. It provides guidelines for the selection of levels of protection, the establishment of preservation and packing of repair parts, the protection of retrograde cargo/returned materiel, occupational safety and health programs, ecological considerations, and reporting of deficiencies/discrepancies. It also includes guidelines for the use of the Container Design Retrieval System (CDRS) and designates lead service testing responsibilities.

This regulation requires the procurement documents to include all pertinent details as to the preservation, packing, and marking of military supplies so that suppliers will be fully informed of military requirements. It emphasizes that adequate protection must be furnished our military supplies at minimum cost.

Army policy, as expressed in this regulation, is that, when a choice of one of several shipping containers is permitted, the choice which provides adequate protection at the lowest overall cost, ecology considered, is to be selected. Each of the major Army commands has the responsibility for the preservation and packing of the materiel for which it has cognizance.

THE ARMY PACKAGING BOARD

Army Regulation AR 15-450 establishes and defines the mission, principal functions, and concept of operation of the Army Packaging Board. The Army Packaging Board is to formulate and recommend planning and policy criteria, and guidance on the packaging of Army materials. On matters pertaining to Army packaging, the Board will --

- Develop guidance and recommendations related to --
  - o Organization of Army packaging activities.
  - o Standardization of materials, methods, procedures and test methods.
  - o Publications concerning or affecting packaging.
  - o Packaging, Research, Development, Test and Evaluation (RDTE).
  - o Packaging in procurement and supply operations.
  - o Reduction of packaging costs.
  - o Packaging reports and management measurement data.
  - o Training for packaging activities.
- Coordinate and participate with other DOD elements in the development of joint packaging policies and criteria.
- Maintain liaison with technical societies and association, independent laboratories, educational institutions and other

Government agencies on matters concerned with packaging or which have a direct relationship to packaging.

- Provide assistance, guidance, and participation in packaging expositions, symposiums and seminars.
- Prepare special studies, surveys and recommendations or other special actions on major packaging problems or matters.

These missions and functions are performed by the Board as a whole or by small committees which report their conclusions and recommendations back to the Board. The Board is composed of a member and an alternate from each of the major subcommands of the AMC, as well as representatives of other interested Army agencies and activities. Each member, therefore, can bring the recommendations of the Board back to his own command and recommend implementation. Conversely, the requirements of each of the sub commands are submitted to the Board by the appropriate member for coordination and review.

A chairman and executive secretary from the Logistics Support Activity, Packaging, Storage, and Containerization Center (LOGSAPSCC) are appointed by Headquarters, Department of the Army (HQDA).

The Board members keep themselves current with packaging developments and field operations by liaison visits to supply depots, terminals, R, D, and E Centers, and commercial packaging contractors or laboratories. The recommendations of the Army Packaging Board are disseminated through their individual commands by the members. Where decision of higher authority is required, submission is through command channels.

General policy guidance for the Army Packaging Board is found in the following documents:

- AR 15-450, Boards, Commissions, and Committees, Army Packaging Board.
- AR 700-15, Logistics-Packaging of Materiel.
- AR 735-11-2, Reporting of Item and Packaging Discrepancies.

ARMY PACKAGING ORGANIZATION

THE DEPUTY CHIEF OF STAFF FOR LOGISTICS, DEPARTMENT OF THE ARMY

DCSLOG has the assigned responsibility for packaging for the Army. However, development and administration of the Army Packaging Program are primarily accomplished by the U.S. Army Materiel Command (AMC) (fig 4-1).

THE MILITARY TRAFFIC MANAGEMENT COMMAND

MTMC is the single manager operating agency for military traffic, land transportation, common user ocean terminals and highways for national defense. For the Department of Defense engineering for transportability program, MTMC executes the transportation oriented aspects assigned to the Department of the Army.

THE MTMC TRANSPORTATION ENGINEERING AGENCY (TEA)

TEA produces land transportability criteria and guidance for DOD and performs functional analyses of transportation systems, as directed. While

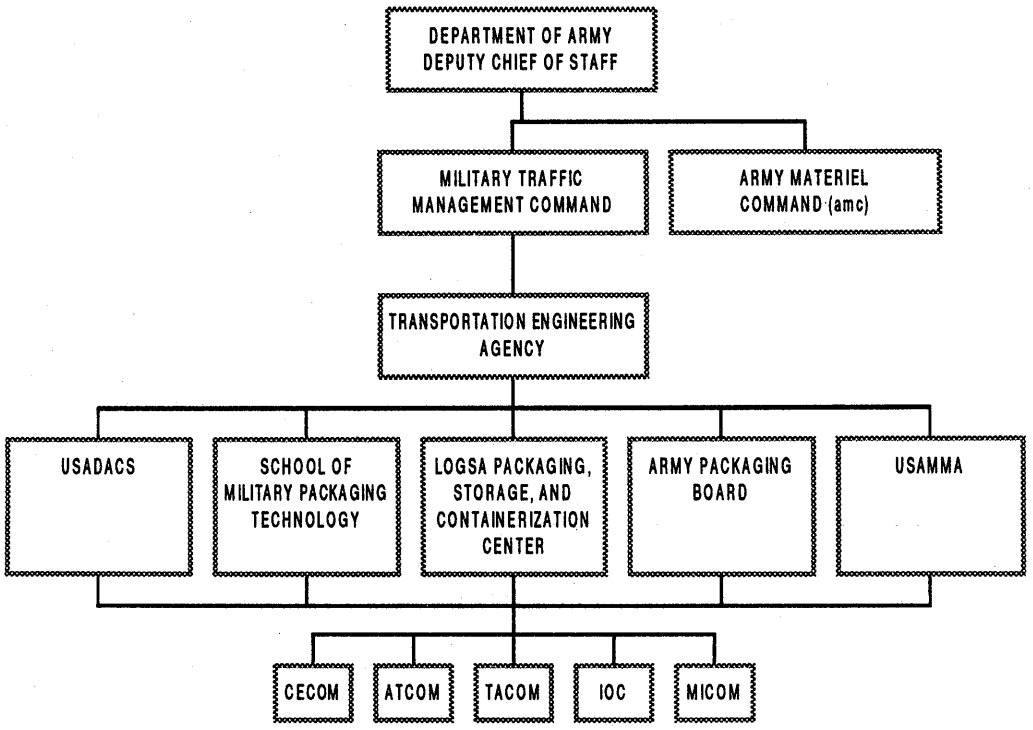


Figure 4-1. The Army Organization for Packaging

MTMC does not maintain a packaging organization/element by specific designation, TEA does conduct studies as requested in the area of packaging. With the approval of the commander, such studies may be performed for any DOD element.

THE U.S. ARMY MATERIEL COMMAND (AMC)

AMC has the primary responsibility for the development and administration of the Army Packaging Program, within AMC. The Office of the Deputy Chief of Staff for Logistics and Operations, and Transportation has the responsibility for implementing the AMC Packaging Program.

AMC accomplishes this by providing packaging policy guidance to LOGSA PSCC for general supplies, the U.S. Army Defense Ammunition Center and School (USADACS) for ammunition, and the U.S. Army Medical Materiel Agency (USAMMA) for medical supplies.

THE AMC LOGSA PACKAGING, STORAGE AND CONTAINERIZATION CENTER (PSCC)

PSCC is one of several logistics-related centers comprising the logistics Support Activity, a separate reporting activity of the Army Materiel Command. PSCC performs functions in technical areas of the packaging of general supplies to include:

- Serves as the AMC executive agent for developing and implanting DOD packaging policy for general supplies and Hazardous Materials.
- Conducts in-depth studies related to packaging materials, equipment, and methods.

- Provides professional engineering and specialized services relating to the testing and evaluation of products and processes for application to packaging and containerization.
- Performs packaging Customer Field Support Program and specialized staff assistance visits to Army troop installations, AMC major subordinate commands, and DOD customers worldwide.
- Performs management functions within the Defense Standardization Program for the PACK area and Federal Supply Group 81GP (containers, packaging, and packing supplies).
- Serves as the Army focal point for packaging data systems.
- Reviews packaging requirements in regulations, standards, specifications, and technical manuals.
- Acts as a Army-industry point of contact for ideas inventions, concepts, and materials which will advance the science of packaging.

U.S. ARMY DEFENSE AMMUNITIONS CENTER AND SCHOOL (USADACS)

USADACS provides professional, non-developmental, and products oriented engineering support to enhance the packaging of ammunition and related materiel through its entire life cycle. It designs equipment and procedures for improving and modernizing ammunition supply operations.

AMC MAJOR SUBORDINATE COMMANDS AND RESEARCH, DEVELOPMENT , AND ENGINEERING CENTERS

Major Subordinate Commands (MSC). Tank-automotive and Armaments Command (TACOM), Communications-Electronics Command (CECOM), Aviation and Troop Command (ATCOM), and Missile Command (MICOM) have the responsibility for exercising integrated commodity management of assigned materiels. Packaging responsibilities for their assigned materiel are:

- Develop packaging requirements for the shipment and storage of assigned materiel and include the requirements in specifications, standards, data sheets, drawings, publications and other applicable media.
- Provide packaging data to support the AMDF.
- Determine and provide degree of protection guidance in all procurement and supply transactions, consistent with AR 700-15 and AMC-R-746-10.
- Prepare and provide outloading procedures as applicable for assigned materiel.
- Perform such packaging Research, Development, Test and Evaluations (RDTE) as falls withing mission responsibility.
- Provide representation to the Army Packaging Board (APB).
- Exercise staff supervision over all command purchases including the packaging of these purchases.

The U.S. Army Research Laboratory manages the research and development efforts of the Army's corporate laboratories and research office. It provides advice to systems planners, project engineers, and others in need of LABCOM's scientific experience and knowledge. LABCOM is AMC's primary source of technical expertise during all phases of the Materiel Acquisition Process.

The Industrial Operations Command's (IOC) mission is to support the soldier in the field. It performs this mission by serving as the direct supply

link to Army units around the world, providing them with everything they need to be an effective combat force. In addition, DESCOM is responsible for maintaining, overhauling, and repairing all major Army systems, from those as large as tanks to those as small and intricate as laser range-finding units.

RESEARCH, DEVELOPMENT, AND ENGINEERING CENTERS

The Natick Research, Development, and Engineering Center (NRDEC) provides packaging engineering support for subsistence, clothing and textiles and other items assigned by the AMC subordinate commands and other DOD components. NRDEC is also an Army custodian and DOD preparing activity for Army Federal specifications on packaging materials. Subject to criteria covered by a Joint Logistics Commander's Joint Secretariat Directive, NRDEC has DOD responsibilities in the area of research, development, and engineering.

The Belvoir Research, Development, and Engineering Center (BRDEC) performs research, development, test evaluation, and engineering in the field of materials (organic coatings, metals, plastic and ceramics, radiation, biodeterioration, rubber and coated fabrics, chemistry, optics and spectrophotometrics). It serves as consultant in materials and packaging technology on assigned commodity items. It designs, develops, and maintains selected packaging specifications and standards. Determines packaging requirements and develops packaging designs for Technical Data Packages (TDP) for ATCOM items.

The Armament Research, Development, and Engineering Center (ARDEC) performs research, development, engineering, procurement, and materiel readiness functions for conventional and nuclear weapons; ammunition (artillery, infantry, gun type air defense, surface vehicle mounted and aircraft mounted); fire control systems; Ammunition Peculiar Equipment (APE); Test, Measurement, and Diagnostic Equipment (TMDE); and tools and maintenance equipment.

The Edgewood Research Development, and Engineering Center (ERDEC) of the Chemical and Biological Defense Command provides packaging engineering support as well as research, development, testing, evaluation, and engineering for defensive biological and chemical agent related items. These include detection equipment and kits, decontamination materials, kits and systems, protective masks, collective protection filtering systems, plus smoke and obscurant materials and systems.

AMC ACTIVITIES

The AMC maintains activities worldwide which receive, store, and redistribute material to their various customers or using activities. Each of these activities supports a packaging activity which has the following responsibilities:

- To repackage stored items as required by results of periodic surveillance inspection.
- To package repaired and modified items for shipment or storage.
- To repackage new receipts to meet the rigors of storage and redistribution when original packaging is inadequate.
- To package outgoing shipments to customers.

CHAPTER 5

Packaging Within the Air Force

GENERAL PACKAGING POLICY

Air Force Joint Instruction (AFJI) 24-206, Packaging of Materiel, and Air Force Instruction (AFI) 24-202, Preservation and Packing, implement DOD Regulation 4140.1-R throughout the Air Force. The latter also establishes management objectives for accomplishing the Air Force packaging mission.

Air Force policy affords supplies and equipment the level of packaging protection necessary to prevent deterioration or damage during handling, shipment, and storage at the lowest overall life cycle cost. The marking of items, packages, and shipping containers shall be in accordance with applicable standards, specifications, and other authorized instructions.

The levels of protection are as described in AFJI 24-206. The application of levels of protection is based upon anticipated storage, use, destination, and mode of transportation.

IMPLEMENTATION OF AIR FORCE PACKAGING POLICY

The policy is applicable to all major Air Force commands. The Air Force Materiel Command (AFMC) is charged with the responsibility for developing specifications and standards for preservation, packing, marking, developing requirements peculiar to the research and development (acquisition) stage of weapon systems before Program Management Responsibility transfer. AFMC is responsible for developing and specifying basic requirements for system (items) in the production and operational stages of a weapon system. The Air Force Acquisition Logistics Center (AFALC) under AFMC is responsible for assuring integrated logistics support from the earliest conceptual stage to deployment and operation of a weapons system and applies "lessons learned" to new acquisitions. AFMC is also responsible for insuring timely integration of logistics considerations into system and cost effectiveness analysis and incorporating Integrated Logistics Support (ILS) requirements into contractual documents.

The major air commands are instructed to communicate directly with AFMC on all packaging matters relating to weapons systems research, development, test, logistical support and acquisition. AFMC also -

- Coordinates and cooperates with industry to the fullest practical extent in development and applying new packaging techniques, methods, and materials.
- Develops packaging methods to be used by contractors which will provide the required protection of items at the lowest overall logistics cost.

PACKAGING COST REDUCTION GUIDANCE

The ALCs and product divisions are instructed to develop a minimum number of kinds, sizes, and types of packages and packs and develop more economical techniques, methods, and materials for preservation and packing. Packaging costs are reduced by:

- Using less costly materials whenever possible.
- Making packs multipurpose.
- Reducing weight and cube to conserve transportation funds.

- Selecting the least costly methods of preservation and packing when more than one method will provide the degree of protection necessary.
- Selective use of packaging services contracts.
- Reuse of containers.

AIR FORCE PACKAGING ORGANIZATION

US AIR FORCE PACKAGING OBJECTIVES

Packaging objective must be in harmony with the overall logistics concept of the Air Force. That concept holds that more and more weapon systems will be supported by air. Overall Air Force objectives for packaging management are to establish and maintain a program which will ensure that Air Force items are afforded required protection at minimum costs from source to user, consistent with deployment and operational requirements. Specific objectives to implement this program are to:

- Identify in the design stage those items which, because of size, weight of fragility, are potential packaging and transportability problems. Ask for redesign to eliminate problems. If not practical to redesign, consider disassembly of oversize items to permit shipment by all modes of transportation, especially air.
- Develop lightweight containers to reduce tare weight yet use durable materials which will permit reuse of containers readily available. Containers which meet these requirements are the Category I Air Transport Association (ATA) Specification 300 containers. These are standard size, off-the-shelf containers produced by numerous manufacturers nationwide.
- Develop systems of standardized, reusable packaging. Fast Pack and Standard Pack are examples of such systems. The principles followed in design are reusability, versatility, and simplicity.
- Broadcast packaging requirements for depot-level repair items to all AF bases through automated data systems. This is accomplished by printing a simple instruction number on DD Form 1348-1 DOD Single Line Item Release Receipt Document.
- Promote recovery and reuse of packaging materials and containers. Require accountability of surplus Category 1 100-trip minimum reusable containers and recycle these in support of incoming systems.
- Require direct shipment of spares from subcontractors and vendors to AFMC depots on provisioning and resupply procurements. Where possible, ship direct from contractor to the AF base customer, thus bypassing the AFMC depot.
- Furnish reusable multi-item containers to prime contractors to use for transportation of complete sets, such as F16 radar, for installation in the weapon system. The containers are returned to subcontractors for reuse. This type of container can be economically adapted to ship other sets of items.
- Avoid cost of engineering development for special design containers by requiring integration of the Container Design Retrieval System using the procedures outlined in Military Standard MIL-STD-2073-1.

To assure repair cycle items entering the AF inventory are packed by the contractor in one of the standardized systems, contract Statements of Work include the requirements that preference must be given to Fast Pack and Standard Pack systems.

HEADQUARTERS, US AIR FORCE

The packaging mission at Headquarters, USAF has been assigned to the Transportation Support and Services Division. It is the responsibility of this division to establish and monitor Air Force policies on packaging matters and coordinate with other Government agencies and required.

The implementation of established packaging requirements is the responsibility of the major commands (fig 5-1). AFMC with its divisions, test centers, and air logistics centers, the Air Force Acquisition Logistics Center (AFALC) and the Air Force Packaging Technology Engineering Facility (AFPTEF) have the major responsibility and cooperate closely to ensure that Air Force materiel will be adequately protected until used.

AFMC is charged with the development, procurement, and delivery to the operational unit of new weapon systems. Contract administration is provided by the Air Force contract Management Division for contracts assigned to the Air Force by the Services' Plant Cognizance Program. Contract administration is also performed by the Defense Logistics Agency's Defense Contract Administration Service (DCAS) through their field offices.

AF Contract Management Division and DCAS through their local representatives perform surveillance of contractors' packaging and materials handling operations. These organizations provide applicable AFMC activities information and recommendations concerning the effectiveness of packaging and materials handling terms, conditions, and instructions directed to the contractor.

Packaging responsibility in AFMC is defined as a transportation function and assigned to the Logistics Support Office. AFMC responsibility for packaging -

- Provides requirements to contractors to facilitate the development or provision of packaging and materials handling devices necessary to support the initial procurement, assembly, and delivery of systems to first point of use or test.
- Sets up offices physically located in or adjacent to the contractor's plant in order to perform quality acceptance of the packaging or materials handling device the contractor has been directed to develop to package systems material for delivery to the designated point of system assembly or use.
- Approves packaging for items classified as research, development, or installs. AFMC (the ALC having management responsibility) will provide or approve packaging for initial and replenishment spares/ repair parts.
- Provides AFMC with technical data related to packaging and materials-handling devices to be utilized throughout the life cycle of a system, as required.
- Provides assistance regarding damage which occurs in the movement of systems as required or voluntarily when such action is warranted. Assures that the magnitude of damage being experienced by a contractor is considered in evaluating performance.
- Provides Certificates of Equivalency, as appropriate, for special container designs developed for shipment of hazardous items that exceed normal Department of Transportation limitations.

FMC has established the Container Design Retrieval System which is a computer based method of retrieving and reusing container designs for shipping and storage containers and container assets for new systems. Operation of this system is covered by Air Force Regulation 71-12, Obtaining, Storing and Retrieving Container Design Data; and by Military

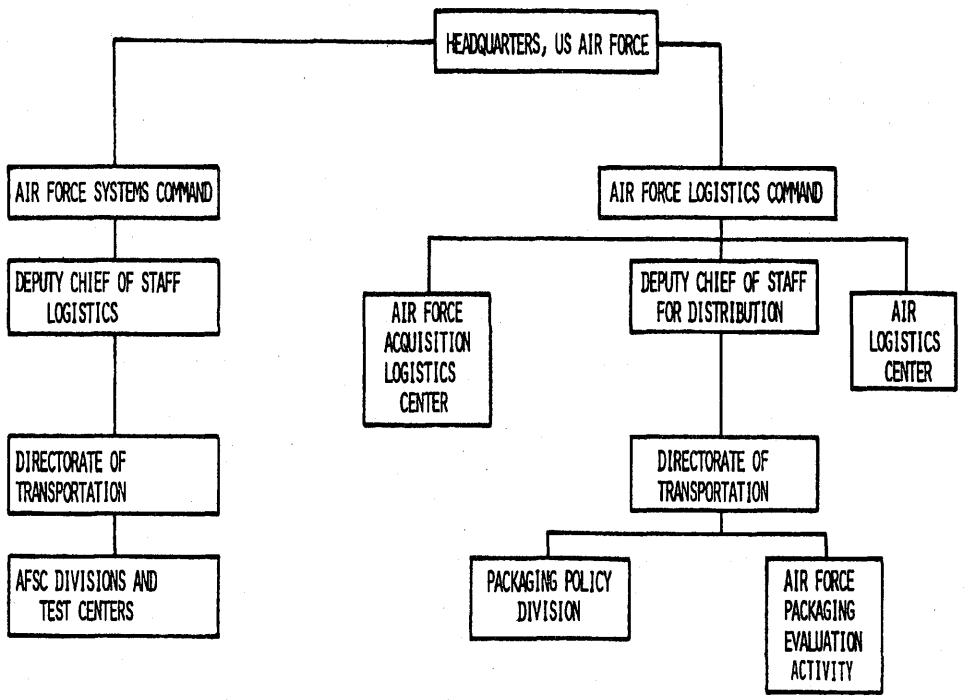


Figure 5-1. Major Elements of U.S. Air Force Packaging Organization.

Standard MIL-STD-2073-1, Standard Practice for Military Packaging, Appendix H.

PRODUCT DIVISIONS AND CENTERS

AFMC has product divisions and centers which provide transportation and packaging guidance and support to program offices during the Research, Development, Test and Evaluation of all new systems, equipment and munitions. Divisions and centers also -

- Specify packaging requirements for inclusion in AFMC procurements of new systems equipment and munitions.
- Provide guidance and assistance to the program manager to assure the attainment of AFMC packaging policies and objective for research, development, test, and AFMC protection contract items. Ensure that appropriate technical direction is provided in the Program Management Document (PMD).
- Ensure that packaging requirements, including those provided by other major commands, are satisfied in design and development of new systems, equipment and munitions. Provide technical reviews and appropriate inputs to planning and program documentation, Required Operational Capability (ROC), PMD and Integrated Logistics Support Plan (ILSP).
- Participate in design reviews, mockup inspections, and other technical assessments to ensure consideration of packaging in the

design, development, test and acquisition of systems, equipment and munitions.

- Review and provide comments and recommendations concerning packaging requirements for research, development, test and AFMC production contract items for inclusion in specifications.
- Assure that packaging for hazardous items undergoing research, development, test and evaluation in AFMC production contract is in accordance with regulatory requirements, or complies with the provisions of AF 71-5 for packaging that deviates from US Department of Transportation regulations.
- Prepare, review, revise and comment on the packaging requirements of standards and specifications.

AIR FORCE MATERIEL COMMAND

The mission of the Air Force Materiel Command (AFMC) is to keep the US Air Force's aerospace weapon systems, wherever deployed in the world, in a state of readiness. The command is charged with providing logistics support-maintaining aircraft, missiles, and equipment; procuring materiel, and services; and managing, storing, distributing and transporting materiel. Logistics activities include four primary functions: acquisition, supply, transportation, and maintenance.

The packaging responsibility in AFMC is assigned to the Directorate of Transportation, Deputy Chief of Staff for Distribution. Both the Packaging Policy Division and the Air Force Packaging Evaluation Activity report to the Directorate of Transportation. The Air Force Packaging Technological and Engineering Facility (AFPTEF) provides a technical engineering capability to AFMC as well as to major commands. Also under AFMC is the Air Force Acquisition Logistics Center (AFALC). The AFALC has a packaging function which examines early-phase acquisition documents to incorporate logistics packaging requirements.

AFMC supports in the development of initial packaging and materials handling devices to assure compatibility with operational phase requirements. It is also the responsibility of AFMC to provide instruction to facilitate the development or provision of packaging and materials handling devices necessary in the support of acquisition, movement, and storage of spare parts and general hardware during the operational life cycle of a system. AFMC also maintains current packaging and materials handling data files for items managed.

AFMC develops and publishes all technical orders required in the packaging and materials handling of systems throughout the life cycle of the system.

AFMC is also responsible for the Air Force Packaging Technology and Engineering Facility (AFPTEC) through the AFALC. The AFALC mission is to participate in the acquisition of aerospace systems equipment to optimize their availability, supportability, and readiness while minimizing life cycles costs. Packaging is an important function in optimizing these characteristics.

AIR LOGISTICS CENTERS (ALCS)

In fulfilling its mission of provisioning operational units, AFMC has established a network of Air Logistics Centers. The ALC's procurement responsibility includes, but is not limited to initial spare parts, components, and Support Equipment (SE); replenishment items for weapon, support, space command and control systems, and Aerospace Ground Equipment (AGE) nonsystem related items and items for which modification and maintenance service are performed.

The ALCs are constantly striving to improve and simplify the packaging procedures for the items under their cognizance. An outstanding example of this effort is the Fast Pack Standardization Program, a family of standard size cushioned shipping containers consisting of four types: Vertical Star Pack; Folding Convoluted Pack, Telescoping Encapsulated Pack and Horizontal Star Pack.

All use polyurethane foam cushioning which is bonded to the inner surfaces of the fiberboard shipping container to assure the integrity of the complete pack. They are especially useful for return of repairables since each size and type is suitable for shipment of a large number of different items within certain limits of size, weight, and fragility.

Because of their versatility, every effort should be made to open the Fast Pack without damaging it and to save the container. The relatively small storage space required, coupled with high reuse value and low labor-time required to repack, have produced enthusiastic response to the Fast Pack program by using bases. The containers are stock listed in the General Services Administration (GSA) Supply Catalog.

The Fast Pack program has also reacted to the advent of microtechnology with respect to the problems created by Electrostatic Discharge (ESD). This was accomplished by requiring the polyurethane cushioning in the Folding Convoluted Pack (type II Slide Pack) to be anti-static. The use of the antistatic fast pack in conjunction with specialized preservation materials will also enhance the reliability of the item.

ADMINISTRATION

Packaging policy for Air Force is promulgated by HQ, USAF. AFMC packaging technicians develop and update the packaging criteria and requirements for logistics support planning for to the Participating and Support Commands. AFMC packaging technicians participate with logistics support planning and logistics support requirements during all phases of systems acquisition. Acquisition, storage, and distribution of spares, spare parts, and general hardware for operational units are handled by the ALCs.

Chapter 6

Packaging Within the Navy

NAVY PACKAGING POLICIES

The joint instruction, "Logistics -- Packaging of Materiel", identified in the Navy as NAVSUPINST 4030.28, implements Department of Defense Regulation 4140.1-R. The regulation contains information and guidance on objective, definitions, general policy, levels of protection and procedures for developing protection requirements, except for ammunition and explosives. The joint operating policies and procedures for ammunition packaging are contained in Chapter 10 of Department of Defense Manual 5160.65-M.

APPLICABILITY

Policy applies to all elements of the Department of the Navy having packaging responsibilities, relating to design, development, procurement, production, supply and maintenance.

In implementing the policy, consideration is given to the following factors as applicable:

- Development of "preparation for delivery" requirements for inclusion in specifications, standards and other applicable documents which:
  - o Conform to policy objectives.
  - o Result in a minimum of tare weight and cube consistent with the degree of protection required.
- Regular review of established preparation for delivery requirements to assure their conformance to the evolving needs of the item to be protected.
- Development of practicable minimum number of material and process specifications, standards and other authorized instructions and their coordination with industry.
- Authorization to use alternate materials and methods when such alternates are considered to be in consonance with policy objectives.
- Development of data by experimental shipments which will provide needed experience for more economical techniques, methods and materials used for preservation and packaging.
- Cooperation with industry to the fullest practicable extent in the development and application of preservation and packing techniques, methods and materials.
- Adoption of standards developed by nationally recognized industry organizations and technical societies when such standards meet Navy requirements.

NAVY PACKAGING BOARD

Functions. The Navy Packaging Board will serve as an advisory staff and coordinating group in carrying out the packaging responsibilities of the Secretary of Defense, the Chief of Naval Operations and the Commander, Naval Supply Systems Command. In addition, the board is responsible for --

- Developing recommendations concerning Department of the Navy and Department of Defense policies for the packaging of materials, supplies, and equipment.
- Fostering continuing contact between those commands and agencies affected by the Department of the Navy Packaging Program for the

purpose of promoting uniform understanding of policies, objectives, implementing programs and logistical requirements.

- Reviewing industry packaging practices and new development to the end that those practices and developments which may benefit military packaging are more rapidly brought to the attention of the members and considered for adoption within their respective commands.
- Providing a channel for the interchange of information on laboratory investigations, field tests, and research and development activities in the packaging field.
- Assuring that packaging related trends having national sociological and ecological implications are given full consideration.

The Navy Packaging Board coordinates with other Department of Defense components in matters of mutual interest in the packaging field. Representation from other Government agencies and departments is invited to participate in meetings as appropriate. Special guests from industry and government may be invited to attend the meetings in advisory capacity.

NAVY PACKAGING ORGANIZATION

PACKING FUNCTIONS OF THE NAVAL SYSTEMS COMMANDS

The management objective of the Navy Packaging Program is to provide all items of naval material with adequate, efficient and economical protection during the various phases of manufacture, distribution, usage and repair. Management is centralized at the departmental level for policy formulation and technical guidance and decentralized at the Systems Command and field levels for the determination of specific packaging requirements commensurate with planned or anticipated logistical demands.

The Navy Packaging Organization is geared to provide effective logistical support by facilitating delivery of supplies in usable condition, protecting quality and reliability, providing markings for identification and safety, and effecting compatibility between package "designs, transportability/handling systems and the limited stowage space available in Navy ships".

Packaging offices of the five Naval Systems Commands, Air, Space and Naval Warfare, Sea, Facilities Engineering, and Supply, function within their respective areas of material cognizance to provide technical guidance relative to the weapons systems, special projects, hardware, software systems, special projects, hardware, software, and facilities (fig. 6-1). Determinations relative to general direction and guidance as well as to packaging matters of common application are made by the Naval Supply Systems Command in collaboration with the other Systems Commands; The Navy Packaging Board, comprising members from each Command, serves as a coordinating group.

Naval Air Systems (NAVAIR). NAVAIR has packaging responsibility in all areas of Naval Aviation, including aircraft weapons, air launched armament items, aircraft components systems, support equipment, facilities, and stations.

Naval Sea Systems Command (NAVSEA). NAVSEA provides professional guidance to all elements of the Navy on packaging and handling ammunition and explosives. Ensures that packaging and handling designs and procedures are developed and used for all surface launched and underwater ammunition, including mines, torpedoes and demolition materials.

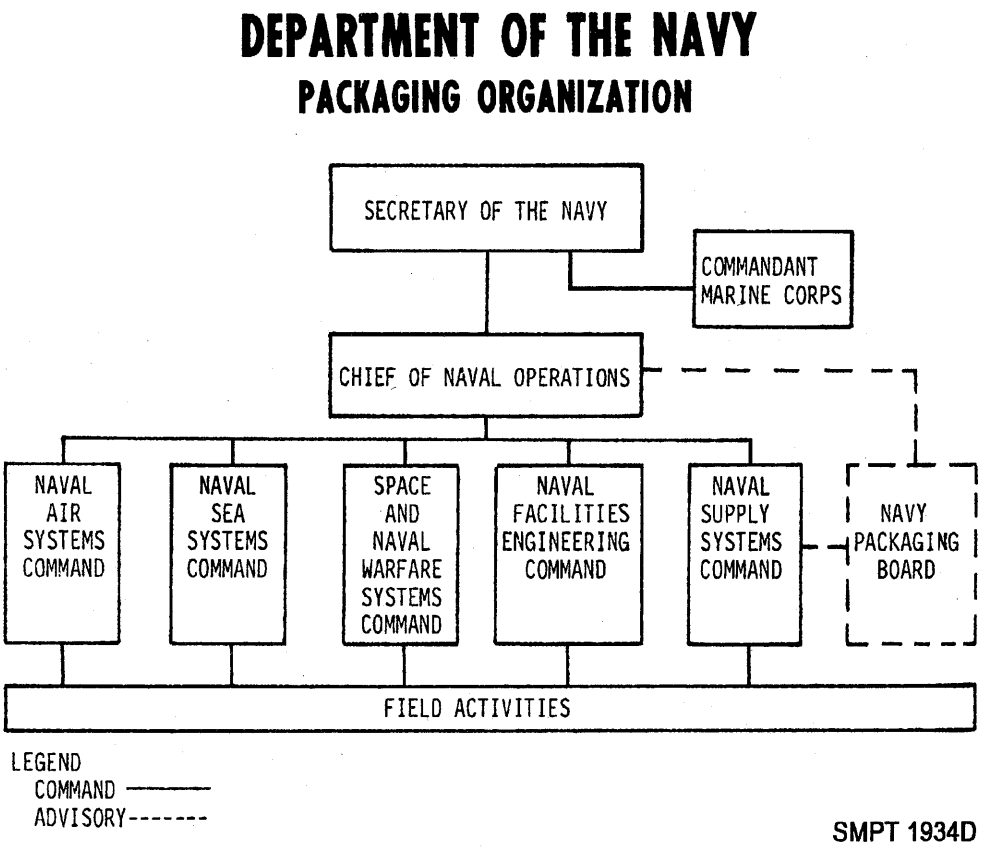


Figure 6-1

Ensures that packaging and handling designs and procedures are developed and used for all ship equipment and parts, including machinery, electrical/electronic items and ordnance except for those items specifically assigned to NAVAIR or SPAWAR.

Space and Naval Warfare Systems Command (SPAWAR). SPAWAR is responsible for the performance and protection of material support functions for complete shore (ground) electronics (except Marine Corps tactical), communications, and shipboard electronic equipment (less antenna systems when not an integral part of the basic equipment). SPAWAR is the single technical authority for electronic standards and compatibility.

Naval Supply Systems Command (NAVSUP). NAVSUP has responsibility for development and promulgation of policies and methods governing supply management of naval material, including preservation, packaging, packing, and marking; administers packaging programs having Navy-wide implications, coordinates within Navy, DOD components, and with Government agencies and industries.

Naval Facilities Engineering Command (NAVFAC). NAVFAC plans, designs, operates, and maintains installations and related facilities and equipment of the naval shore establishment, including advance bases such as yards, docks, floating cranes, amphibious equipment, fleet moorings, surface and subsurface ocean structured; public utilities; construction;

transportation and weight-handling equipment. Develops packaging requirements to be in consonance with these operations.

MAJOR PACKAGING RESPONSIBILITIES

Attainment of the objectives is dependent upon effective discharge of packaging responsibilities. Major responsibilities are as follows:

- Naval Supply Systems Command. The Commander, Naval Supply Systems Command, is responsible of providing supply management policies and methods (technical guidance) relative to packaging of Navy material to activities of the Navy. In the performance of this responsibility, the Commander, A Naval Supply Systems Command, will draw upon the material management experience and capability of the cognizant systems commands inherent in the execution of their assigned material support mission. The Commander, Naval Supply Systems Command is also responsible for:
  - o Representing the Navy in the development of Department of Defense packaging policy and presenting the Navy position after collaboration with systems commands and project managers.
  - o Establishing, after coordination with systems commands and project managers, packaging policies and reviewing the implementation thereof.
  - o Maintaining appropriate liaison with the chief of Naval Operations to assure that packaging policies are in consonance with operational and mobilization planning.
  - o Evaluating, coordinating as appropriate, and responding to industry, Secretarial and congressional inquiries and GAO (General Accounting Office) and Audit Service reports of a general nature having Navy-wide application.
  - o Coordinating packaging programs and projects having common application within the Navy and with other DOD Components, civil agencies and industry.
  - o Providing direction and guidance to the Navy Packaging Board.
  - o Conducting a continuing review of procedures for the packaging of items being returned for repair or overhaul and initiating such implementing or corrective action as the review may indicate.
  - o Developing, in cooperation with cognizant training authorities, packaging training programs determined necessary to meet operational requirements. Developing Navy input to training doctrine and publications developed for joint service use, and advising on the technical and administrative aspects in joint service training programs.
  - o Monitoring Navy action on packaging discrepancies and their corrections, as delineated in the Joint directive, Reporting of Item and Packaging Discrepancies (DLAR 4100.55/AR 735-11-2/SECNAVINST 4355.15/AFR 400-54/MCO 4430.3J).
  - o Sponsoring cost effectiveness studies to optimize cost of ownership of packages while fulfilling the packaging objectives.

- Systems Commands and Project Mangers. Systems Commands and Project Managers are responsible for --

  - o Establishing packaging requirements consistent with the objectives of the Department of Defense and Navy packaging policy for each item under their technical cognizance and for implementing these requirements in procurement, Navy manufacturing operations and repackaging of material to be returned to stock. When more than one major element within the Navy is concerned with an item, minor users will adopt the

requirements of the element having program management cognizance over the item unless there are compelling reasons to the contrary.

- o Issuing such instruction as may be necessary to insure the continued integrity of the package protection initially provided during the period material is in the logistics system.
- o Requiring maintenance of adequate packaging of stocks for which they have storage custody responsibility.
- o Participating in the Department of Defense program for reporting and correcting packaging deficiencies.
- o Initiating, developing and conducting such packaging training programs as may be needed to support their distributive mission.
- o Providing support to those phases of integrated logistics support dealing with packaging, handling, storage and transportation.
- o Requiring that adequate protection is provided to unserviceable items returned for repair.
- o Providing, when appropriate, reusable containers and internal fitment needed for protecting repairable items during their life cycle and establishing, when appropriate, systems for control, deployment, repair and disposal of such containers and packaging materials.
- o Conducting, or causing to be conducted, RDT&E (research, development, test, evaluation), product improvement studies, and in service engineering efforts of methods, procedures and materials for packaging items under their technical cognizance.
- o Evaluating, coordinating and including packaging requirements recommended by industry or other DOD components in appropriate documentation for which they have custodial responsibility.
- o Conducting, or causing to be conducted, investigations of packaging materials, methods and equipment to determine the need for revising existing standardization documents, or initiating new document as indicated or as assigned.
- o Developing necessary standardization documents for packaging materials, methods and equipment, and coordinating with other DOD components, systems commands, civil agencies and industrial associations as appropriate.
- o Initiating cost effectiveness studies to optimize cost of ownership of packages.
- o Evaluating and responding to industry, Secretarial and Congressional inquiries and GAO and Audit Service reports on packaging matters within their assigned mission.

- Commanders in Chief and Chief of Naval Training. The Commander in Chief, US Atlantic Fleet; Commander in Chief, US Pacific Fleet; Commander in Chief, US Naval Forces, Europe, and Chief of Naval Training are responsible for:
  - o Issuing such instructions as may be necessary to insure the continued integrity of the package protection initially provided during the period material is in the logistics system.
  - o Requiring maintenance of adequate packaging of stocks for which they have storage custody responsibility.
  - o Participating in the Department of Defense program for reporting and correcting packaging deficiencies.
  - o Initiating, developing and conducting such packaging training programs as may be needed to support their distributive mission.
  - o Requiring that adequate protection is provided to unserviceable items returned for repair.

CHAPTER 7

Packaging Within the Marine Corps - Advantages of Automatic Data Processing

MARINE CORP PACKAGING POLICIES

The Marine Corps, participating with other Department of Defense (DOD) components, implemented DOD 4140.1-R with the issuance of a joint service regulation. This regulation, identified for the Marine Corps as MCO 4030.33, established uniform policies, defines and prescribes the application of military levels of protection and the use of industrial type packaging. The DOD and joint service policies are supplemented as necessary by instructions issued in the 4030 series of Marine Corps directives.

MARINE CORPS PRESERVATION, PACKAGING, AND PACKING (P3) COMMITTEE

MCO 5420.17 establishes and states the functions and responsibilities of the Marine Corps Packaging Committee.

PACKAGING ORGANIZATION

Packaging Management and Administration

Marine Corps programs for packaging are under the cognizance of the Deputy Chief of Staff for Installations and Logistics (DC/S I&L), Headquarter Marine Corps. Materiel Policy Readiness Branch (MPRB) (fig. 7-1) is the focal point for packaging and provides the DC/S I&L with staff assistance in the management and administration of packaging programs. Thus, the Logistics Policy Requirements, and Readiness Branch --

- Participates with major DOD components in the development and implementation of Department of Defense/joint service packaging policies.
- Develops and promulgates policies and selection/application criteria for adequate, economical life-cycle protection for all Marine Corps materiel procured, stored and issued.
- Provides guidance to other Headquarters activities whose mission involves or interfaces with packaging and to field activities in executing their designated mission for packaging. This responsibility may be concerned with:
  - o Coordination/review of "preparation for delivery" requirements developed for inclusion in Federal and military specifications and standards and procurement documents, to ensure compliance with packaging policy objective.
  - o General surveillance over packaging facilities and operations at the various field activities.
- Establishes and maintains necessary liaison with other DOD components, Federal Government agencies and industry.
- Plans and conducts conferences, staff visits as deemed necessary to promote effective and efficient packaging programs.
- Coordinates packaging innovations (and packaging improvement requests) which are of interest to more than one Marine corps activity.
- Provide marine Corps membership/representation for DOD and/or joint service boards/committees/working groups, as appropriate.

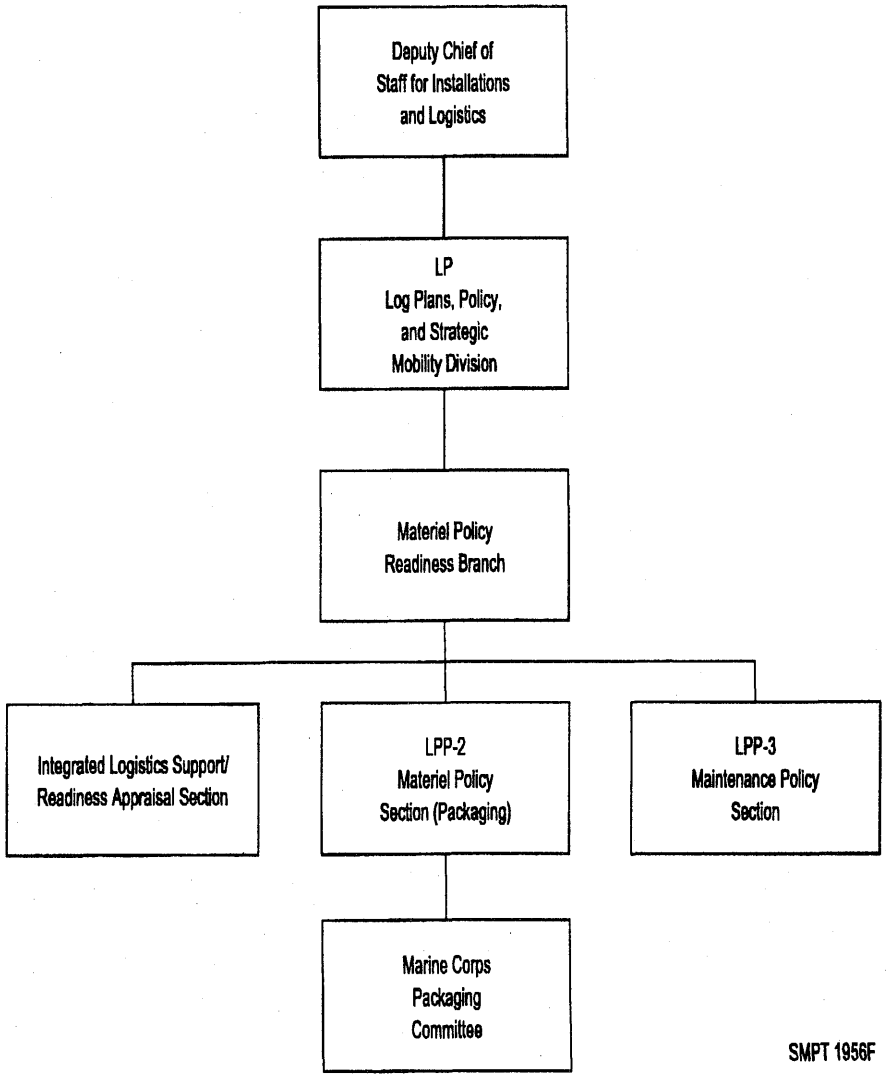


FIGURE 7.1. MARINE CORPS PACKAGING ORGANIZATION

- Reviews and takes appropriate actions on inquiries to use alternate/substitute materials.
- Participates in determining and establishing packaging training programs, in cooperation with cognizant training agencies internal and external to the Marine Corps.

PACKAGING RESPONSIBILITIES

In conjunction with the above functional management responsibilities of Code LPP and Code LPP-2, the DC/S I&L has delineated the following:

- Commands having inventory management/materiel responsibility at the wholesale retail level will
  - o Ensure the development of adequate technical packaging requirements (specification and standards, procurement work orders, etc.) for all items for which the command has materiel acquisition and/or stock management responsibility.

- Initiate actions to ensure that adequate protection is provided at time of procurement, prior to entry of new acquisitions into the supply system.
- Determine economical, realistic unit and intermediate pack quantities to be incorporated into packaging requirements cited in procurement actions and/or distributions directives.
- Provide for, when appropriate, the development and acquisition of reusable containers needed for the protection of reparable items during their life-cycle and establishing, as necessary, criteria for control, utilization, repair and reutilization of such containers.
- Establish and maintain current technical packaging data files for items for which the agency/office has procurement or management responsibility. This packaging data may be in the form of specification, standards, preservation data sheets, drawings, microfilm-fiche, etc.

• Procurement activities (all echelons)--
- Will initiate actions to insure that the specified levels of preservation and packing are followed through in Invitation to Bid and/or other procurement instruments and contract administration.
- Obtain a breakout of packaging charges in applicable procurement documents, when such costs are significant and institute measures to evaluate the fairness and reasonableness of the commercial contractors charges for military packaging.
- Participate in evaluating commercial/trade practice packaging and promoting the acceptance thereof when such will satisfy the logistical requirements and is cost advantageous.

• Storage and redistribution activities (includes quality control/quality assurance) will --
- Provide effective management of packaging organization and facilities that will --
  - Accomplish adequate protection for materiel in need of preservation and/or packing as determined by receipt or in-store inspections and preparation for shipment. The packaging afforded should meet the specified or appropriately determined level of protection for CONUS or overseas storage and distribution and satisfy the logistical requirements for Fleet Marine Force (FMF) consignment or deployments.
  - Adhere to the technical requirements of specifications, approved preservation data sheets, drawings, etc., utilizing approved methods and materials.
  - Acquire/develop and maintain current packaging technical data files and assure the availability of up-to-date specifications, standards, data sheets, aperture cards, drawings, etc., either in hard copy form or on microfilm/microfiche or similar data storage and retrieval system.
- Effect consolidation/unitization of materiel for shipment in accordance with prescribed procedures and methods.
  - Submit recommendations for packaging improvement as provided for by SECNAVINST 4355.18 particularly when observed packaging is inadequate or excessive to the need of an item, packed in accordance with existing specifications.

- Ensure the proper preparation of hazardous materiels, to include authorized certification that the packaging conforms to the requirements of the Department of Transportation and/or Department of Defense directives as prescribed in joint service regulation MCO P4030.19, Preparation of Hazardous Materiels for Military Air Shipment.
- Keep abreast of DOD/Government/industry trends and developments in packaging materials, methods and techniques and make recommendation to the Commandant of the Marine Corps for analysis, research, test or evaluation, as warranted.
- Report significant packaging problems that require technical resolution to the Commandant of the Marine Corps or inventory control point, as applicable, with appropriate recommendation.
- Afford minimum protection for unserviceable reparable assets awaiting repair. Such preservation should be adequate to prevent deterioration to a lower status in the interim.
- Establish an effective packaging maintenance plan which will ensure continued integrity of protection previously provided. Such plan will also provide for renewal of protection that is suspect or questionable due to aging of applied materials or circumstances of storage.

- Fleet Marine force and Reserve activities. Operate packaging facilities that will be adequate for the accomplishment of preservation and packing to ensure than the integrity of unit protection afforded materiel prior to shipment form supply source is maintained until materiel is placed in use. These facilities will be adequate also to upgrade the quality of original protection, when warranted and provide for necessary protection for reparable assets in retrograde movement.

Marine Corps air facilities and stations will provide facilities and capability for packaging with emphasis given to the selection of materials and techniques that permit the use of lightweight containers, without sacrificing item protection.

During processing of avionics peculiar spares, particular concern will be given to the high cost and critical application of such components and the protection provided will ensure long storage life and maximum utility. Keep abreast of aviation industry development in packaging and take appropriate action to adopt these techniques when such will improve the quality, efficiency and economy of packaging Marine Corps aviation peculiar assets.

ESSENTIAL EXTERNAL PACKAGING RELATIONSHIPS

Liaison and/or membership is maintained of various DOD joint service boards and committees concerned with DOD packaging technology, management, administration and personnel training. These include, among others --

- Department of the Navy Packaging Board
- Department of the Army Packaging Board
- Defense Logistics Agency Packaging Board
- Defense Packaging Policy Group (DPPG).

CHAPTER 8

Acquisition

ACQUISITION OF PACKAGING

The joint implementation of Department of Defense Materiel Management Regulation 4140.1-R and the Federal Acquisition Regulation (FAR) emphasizes that appropriate preservation, packing and marking requirements must be included in procurement documents.

Policy documents provide that all military materiel be given adequate preservation, packing, and markings at the time of procurement, so far as practicable, to preclude costly reprocessing during the distribution process.

Use of levels of protection higher than necessary will be avoided in the interest of economy.

Contractor's pack will be used when it will meet the anticipated distribution requirements.

Acquisition of supplies protected at levels lower than ultimately needed results in only temporary savings. This practice is generally more expensive in total cost to the logistic system and can impair its ability to meet emergencies.

The statement of requirements will be clear and in sufficient detail to obtain adequate protection and marking of supplies and equipment.

Sufficient information, as to the type of shipment, handling, and storage conditions to be encountered to insure that economical and adequate levels of protection are indicated in requests for acquisition and in acquisition documents, must be provided the packaging component of the activity responsible for managing the item.

In case of a national emergency requiring partial or full mobilization to support combat operations overseas, materiel subject to damage or deterioration in shipment, storage, or handling, and which may be used in overseas operations, will be afforded preservation and packing necessary for overseas shipment.

PACKAGING REQUIREMENTS

MIL-STD-2073-1, Standard Practice for Military Packaging outlines standard processes for the development and documentation of military packaging, as distinct from commercial packaging. This standard covers methods of preservation to protect materiel against environmentally induced corrosion and deterioration, physical and mechanical damage, and other forms of degradation during storage, multiple handling, and shipment associated with the military distribution system.

APPLICABILITY

The requirements of MIL-STD-2073-1 shall only be applied to the packaging of items that are expected to enter the military distribution system. Items not going into stock shall be packaged in accordance with standard commercial practice as defined in ASTM D 3951. Items of this exclusionary nature include, but are not limited to, the following:

- Items intended for immediate use
- Items for not mission-capable supply

- Items intended for depot operation consumption
- Small parcel shipments (CONUS), not-for-stock
- Direct vendor deliveries (CONUS)

Exceptions to the above criteria are items intended for delivery-at-sea or delivered during wartime.

Basic information on military packaging requirements and techniques is found in two publications Packaging of Materiel-Preservation (Volume I) and Packaging of Materiel-Packing (Volume II). Respective designations are TM 38-230-1/DLAM 4145.2, Vol. I/NAVSUP Pub 502, Rev. Vol. I/AFP 71-15, Vol. I/MCO P4030.31C; and DLAM 4145.2, Vol. II/TM 38-230-2/NAVSUP Pub 503, Vol. II/AFP 71-16/MCO P4030.21C.

RESPONSIBILITY

The packaging component of the service or acquisition activity having management responsibility for an item has the responsibility for determining and stipulating packaging requirements. The contracting officer is responsible for the contents of all procurement documents, such as invitations for bid, purchase orders, and contracts. The contracting officer must be certain that these documents conform to military policy and are legally sufficient. The contractor is also responsible for protecting the interests of the Government and for the inclusion of incentive clauses and value engineering clauses in contracts, when authorized by the Federal Acquisition Regulation (FAR) so that total acquisition cost may be reduced.

The use of these clauses in contracts is especially effective in reducing production costs as they offer additional profits to the contractor who produces acceptable material more efficiently and is able to engender lower production and material cost.

They have a particular application to packaging where the cost of production has in many cases been changed to overhead instead of being identified as a separate cost. In the development and modification of many items, the packaging originally prescribed for the prototype is often carried over into subsequent modes, although the item characteristics may have been changed drastically, and the item has been made rugged and more corrosion-resistant.

BASIC PACKAGING REQUIREMENTS

MIL-STD-2073-1 sets forth all basic concepts of preservation (by type of protection required) for all items in the military supply system, along with various performance tests and visual examinations to insure that accepted packages meet established requirements. The preparing activity is the Naval Air Warfare Center Aircraft Division.

It must always be kept in mind that the function of the package is to protect the item and that in developing packaging requirements, the item must be the primary consideration. Military packaging shall be of minimum cost consistent with required performance. Unit packs shall be designed to conserve weight and cube while retaining the protection required and enhancing standardization.

The military preservation procedure should be accomplished without interruption. when interruptions are unavoidable, temporary wraps, covers or enclosures shall be provided to insure against contamination or deterioration of the items.

Items shall be cleaned and dried by any suitable process or processes which are not injurious to the item. When contact preservatives are required to protect an item from chemical deterioration, it should be those whose application, use or removal will not damage the item or impair item function. The application of contact preservative should be directly after cleaning and drying of the item. The required preservative shall be

uniformly applied by any applicable procedure that permits the preservative to coat all necessary surfaces.

There are five basic methods of protection defined, ranging from physical and/or mechanical protection only, to a highly water-vaporproof method. Each of these basic methods embodies within it the physical and mechanical protection required by the item plus various modifications to make the package waterproof and water-vapor-proof, if required. Three of these basic methods are divided into submethods which describe various combinations of barriers or containers or both, which are designed to afford the protection required by the concept of the basic method. These five basic methods and the allied submethods are described as follows:

- Method 10 affords physical and mechanical protection only. Method 10 unit packs may vary from a simple tag or envelope to a carton or box with interior dunnage or devices designed to provide needed protection from shock in handling.
- Method 20 affords protection by the use of a contact preservative.
- Method 30 affords waterproof protection by the use of various barrier materials and containers. Method 31, 32, or 33 employs a different barrier or container to achieve the required waterproof protection.
- Method 40 affords water-vapor-proof protection through the use of a water-vapor-proof barrier, container, or combination of these materials. Method 41, 42, 43, 44, or 45 utilizes these various enclosures for the item.
- Method 50 gives highly water-vapor-proof protection to critical or corrosion sensitive surfaces by the addition of a desiccant or drying agent within the package. Method 50 is identical to Method 40, but adds desiccant and a humidity indicator to show the relative humidity within the package.

Items within the package will be identified by marking the package in accordance MIL-STD-129 or in accordance with other requirements as prescribed. There are various tests prescribed for the packages, which, in effect, test the efficiency of the barrier materials, cushioning, containers, and closures (fig 8-1).

PACKAGING MATERIAL REQUIREMENTS

The packaging engineer or technician, when selecting packaging material, may look for many characteristics, either individually or in combination, so that the completed package will afford the required protection to the item. Packaging materials may be classified and their requirements listed as follows:

- Cleaning materials, including petroleum-based solvents, alcohols, acids, alkalis, detergents, emulsifying cleansers, abrasives, impact tools, and water.
    - o The basic requirement for these materials is that they be in themselves clean and free from contamination.
    - o They must be capable of removing all corrosion-causing contaminants from the items.
    - o In the case of strong chemical cleaners, such as acids and alkalis, there must be built-in controls, or inhibitors, to limit the attack of such cleaners on the base metal.
- Preservative materials, which include permanent preservatives for metals, such as plating and chemical coatings, preservative for non-metals, such as leather dressing and wood preservatives, and temporary preservative for metals, such as greases, oils, and volatile corrosion inhibitors.

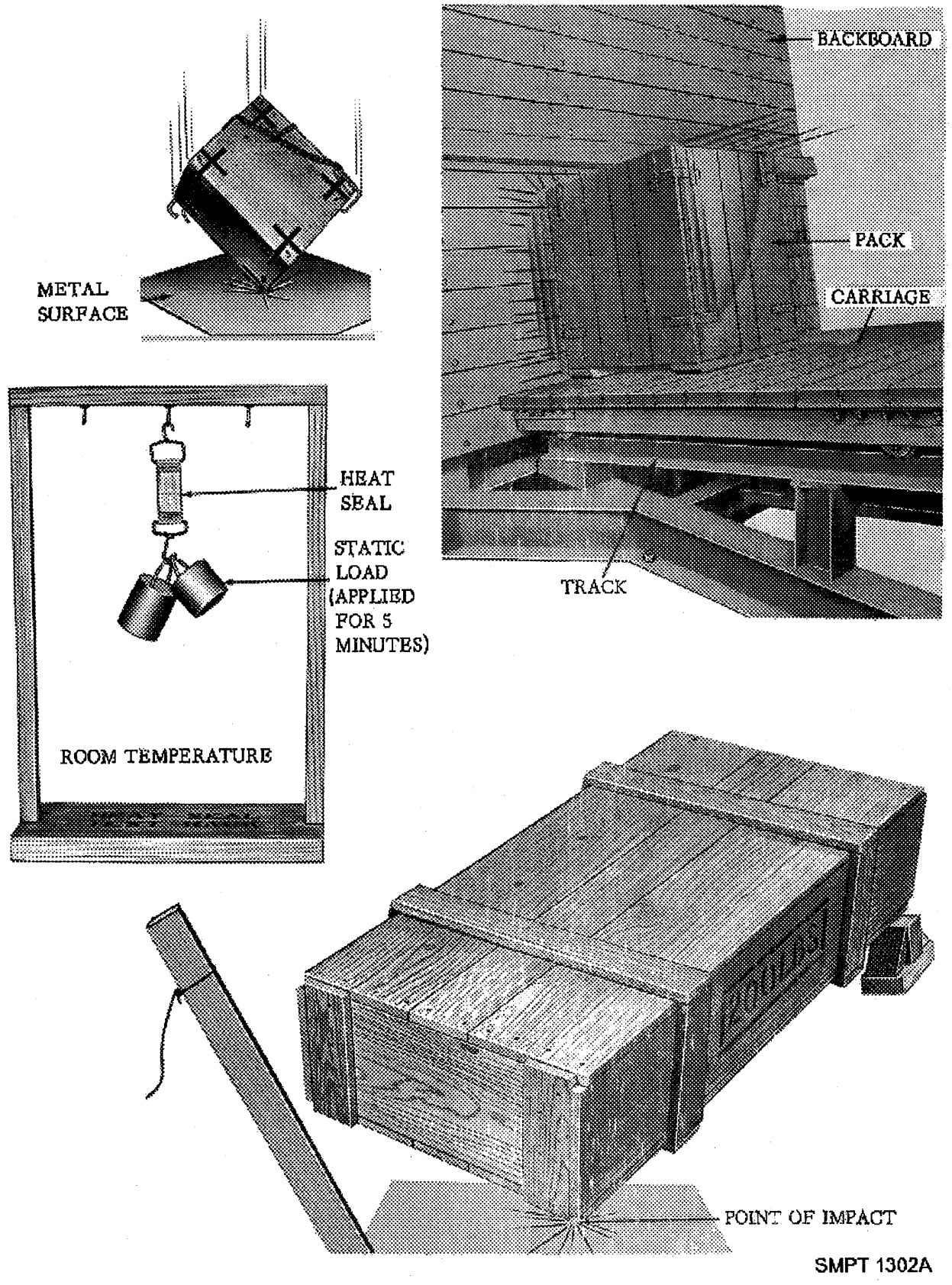


Figure 8-1. Testing of Packages and Packs.

- The basic requirements for preservative materials are that they be capable of protecting the underlying material from environmental attack, and that they be compatible with it.
- Permanent preservative coating for metal items must be properly applied and must be of sufficient thickness and hardness to meet design requirements.
- Preservatives for nonmetals must be compatible with the item, must not stain or discolor the material, and, if possible should be nontoxic and nonirritating.
- The temporary preservative for metals should be relatively easy to apply and remove, should give protection over the required period of time, should be capable of being applied in a continuous unbroken coating, and should retain their characteristics over a wide temperature range.

- Wraps, cushioning materials, and dunnage are materials that include the intimate wraps for the items, cushioning, shock-mitigation devices, shielding wraps for magnetic devices, and various containers that are used as dunnage within the barriers that constitute the unit package.
  - Characteristics, such as absence of corrosivity waterproofness, greaseproofness, moldability, tear strength, and puncture resistance, are important in the wraps which come into intimate contact with the surface of an item.
  - Cushioning materials are tested for resilience, compression set, rate of recovery, tensile strength, abrasiveness, liquid absorbency, resistance to attack by fungus, insects, and rodents, pH factor (noncorrosiveness), constancy of characteristics in extreme temperature and humidity conditions, insulation values, moldability, and die-cutting or preforming adaptability.
  - Shock mitigation devices must have acceptable mounting accommodations, vibration damping, and elasticity characteristics. Size and weight must be within predetermined limits and, if they are to be used outside the pack, as in open freight car loading, must be corrosion resistant.
  - Shielding wraps for magnetic devices must be capable of limiting the external electromagnetic forces below predetermined limits. Unrestricted electromagnetic fields can cause errors in magnetic compass reading and can damage other cargo sensitive to electromagnetic fields.
  - Containers used as dunnage must be capable of carrying the load, meet requirements as to dry and wet bursting strength, be puncture-resistant, and should be filled and closed with a minimum of labor.

Barrier materials include waterproof and water-vaporproof wraps, plastic coatings, and waxes. Requirements for these materials include determination of moisture-vapor transmission rates, heat sealability, shelf life, application temperatures, tear strength, puncture resistance, and cushioning qualities. As their nomenclature indicates, these barrier materials actually furnish the required quality of protection to the item. Close adherence to their specified characteristics is required.

Containers used in unit packs and exterior packing range in size from the small paperboard, set-up or folding boxes, to specially engineered vans and trailers which have built-in shock-mitigating devices and environmental controls.

Strength of material, fabrication methods reliability, reusability, and cost are some of the factors that must be considered. Since it is the container that furnishes most of the physical and mechanical protection to the contents, it must be designed to withstand normal anticipated hazards of transport and storage.

Closure devices include tapes, flat and round steel strapping, nonmetallic strapping, heat-sealing machines, gaskets, adhesives, staples, twine, rope, bolts, locking rings, nails, clips, and screws. For most of these devices, tensile strength is of prime importance. Metallic fasteners should be corrosion-resistant; nails and screws must have sufficient holding power to perform satisfactorily; and tapes and adhesives must meet minimum adhesion requirements.

Heat-sealing machines and other mechanical-closing machines must make the closure so that it will pass all the required tests and inspections.

The requirements for packaging and packing materials are so many and varied that it is evident that every aspect of the problem of protecting and maintaining the item has been considered in these material specifications.

THE FUNCTION OF THE PACKAGING SPECIALIST IN ACQUISITION

The function of the Packaging Specialist is basically the same in military departments and civilian agencies of the Government. Duties may be performed in quality assurance, transportation, acquisition, storage, or any other of the logistic support areas. The mission in part is interpreting policy, monitoring requirements and performance, and analyzing packaging costs to assure adequate packaging at minimum cost for safe delivery of the materiel to the ultimate consumer.

The way in which the Packaging Specialist functions may vary between civilian agencies or even between divisions within each department or agency. This depends on the requirements of the service and how the specialist's function fits into the overall mission.

RESPONSIBILITIES OF THE PACKAGING SPECIALIST

Preparation of Packaging Data for Acquisition Documents. Defense Policy requires that pertinent, detailed packaging requirements be included in all acquisition documents. It is the responsibility of the Packaging Specialist to prepare this data, to review previously prepared packaging requirements, and to institute such changes as may be dictated by current policy or by newer materials and techniques which would result in adequate protection at minimum overall cost.

In reviewing existing packaging data, the Packaging Specialist must be aware of technological improvements made to the equipment which would have an effect on the amount and kind of preservation required to protect the item from shipping, handling, and storage hazards.

The Packaging Specialist must apply the parameter of potential cost to every preservation and packing prescription and include in the requirements only those methods, materials, and containers which will provide the required degree of protection at minimum cost.

The packaging requirements are coordinated with the technical personnel having knowledge of the item, and of transportation, storage, and other elements of the supply system to insure compatibility with their capabilities.

ASSISTANCE IN CONTRACT NEGOTIATIONS

The Packaging Specialist, as a member of the contracting officer's team, may be called on to furnish packaging cost estimates in support of the Government negotiator. The Packaging Specialist has several sources from which to draw the information to base his estimate. Among these are--

- Indefinite delivery-type packaging service contracts. Some activities have entered into indefinite delivery-type (open-end) contracts with commercial packaging contractors as a packaging cost reduction measure and also to have a source of packaging capability available when needed. These contracts are available to the Packaging Specialist, and the packaging costs derived from them furnish an

excellent yardstick for measuring the acceptability of offers made during negotiation.

- Knowledge gained through experience. Many packaging specialists, applying the knowledge they have gained through years of experience in this field, can improve the accuracy of the cost estimates derived from documentary sources.

PREAWARD SURVEYS

Prior to the award of a contract, the contracting officer may determine that a survey of the prospective contractor's plant facilities, capabilities, and skills be made to determine if the contractor is capable of meeting the requirements imposed by the contract and making satisfactory, timely delivery of the material or equipment ordered. Since this function is a normal Defense Contract Management Command (DCMC) function, the survey will be requested of the cognizant Contract Administration Office (CAO).

KNOWLEDGE AND BACKGROUND REQUIRED

Because of the complexity of the job, the Packaging Specialist working in acquisition must have a thorough knowledge of preservation and packing materials and techniques, of shipping and storage conditions and requirements, and of the capability and limitations of material-handling devices and automated material-handling systems.

The Packaging Specialist must keep abreast of new developments in materials and techniques and should be alert to suggest their adaption whenever they are suitable for military use, if adoption will result in cost reduction.

The Packaging Specialist also must be kept informed or made aware of technological changes in military material and equipment in order to institute changes in packaging requirements as indicated by the characteristics of the modified items.

The Packaging Specialist must keep current in the knowledge of content and interpretation of policy documents as they affect packaging, and implement packaging prescriptions withing the guidelines as applicable.

The Packaging Specialist must be constantly aware of the cost factor in packaging and be receptive at all times to suggestions and recommendations from DCMC Packaging Specialists for changes which will provide required protection at less cost.

PACKAGING COST ANALYSIS

PACKAGING COST FACTORS

Packaging costs are very often considered as part of the general overhead. In the past few years, however, due to the general interest in all basic costs, there have been many successful attempts made to segregate packaging costs from general overhead. The costs more commonly assigned to the packaging function (fig 8-2) are--

- Packaging materials include cleaning and drying materials, preservative, wraps, barriers, cushioning, containers, labels, tags, and container closures, such as tape, adhesive, and steel strapping.
- In addition to the cost of the material itself, these costs include the cost of procuring, storing, controlling, moving, protecting, and assuring the quality of these materials, plus the cost of financing the inventory and the factor of disposal of scrap and surpluses.

The cost of designing packaging--

- In most cases, the military, through specifications and standards, has relieved the contractor of this cost.
- This includes, where applicable, the costs of the planners, the designers, and the technicians, the clerks, and the supplies and equipment necessary to develop, test, and prove the packaging.
- In all cases, even though the packaging requirements have been furnished, the cost of testing and proving the packaging must be included.

The costs of the packaging line includes the cost of labor, tools, amortized capital equipment, maintenance, space, utilities, production controls, and industrial engineering.

The cost of damage includes not only the loss of the goods, but also the failure analysis and redesign costs.

The costs of administrative services, including training, research, specification and contract review and negotiation, and the cost of maintaining a technical library.

INDUSTRY INTEREST IN PACKAGING COSTS

Industry is constantly examining packaging costs, especially in those areas where competition is keen and the award or loss of a contract may hinge on a few mils of excessive cost in one operation. The cost of commercial packaging, as one of the major costs in the commodity price, is under constant review. Single Process Initiatives will permit alternative pricing by vendor. As the interest of the military in packaging costs increases, industry has been paying much closer attention to these (i.e., military) packaging costs.

MILITARY INTEREST IN PACKAGING COSTS

In order to support budgetary requirements the military must supply Congress with exact cost in every facet of its operations, including packaging. To keep within its budget, each service must monitor its expenditures as they occur and must accurately forecast future expenditures.

PRESERVATION AND PACKING COST REDUCTION

This area encompasses management improvements associated with the application or use of preservation, packing, and marking materials, and techniques to protect equipment and supplies during shipment, handling, and storage.

The following definitions apply to this area:

- Preservation. Application of protective measures, including cleaning, drying, preservative materials, barrier materials, cushioning, and containers when necessary.
- Packing. Assembling of items into a unit, intermediate, or exterior pack with necessary blocking, bracing, cushioning, weatherproofing, reinforcement, and marking.
- Packaging is the processes and procedures used to protect materiel from deterioration and/or damage. It includes cleaning, drying, preservation, packaging, marking, and unitization. This is a comprehensive term which includes preservation and packing above.
- Packaging cost reduction is the cost differential between the before management action cost and the after management action cost.
- Tare weight is the difference between the bare item weight, prior to packing and the gross weight of the packed item.

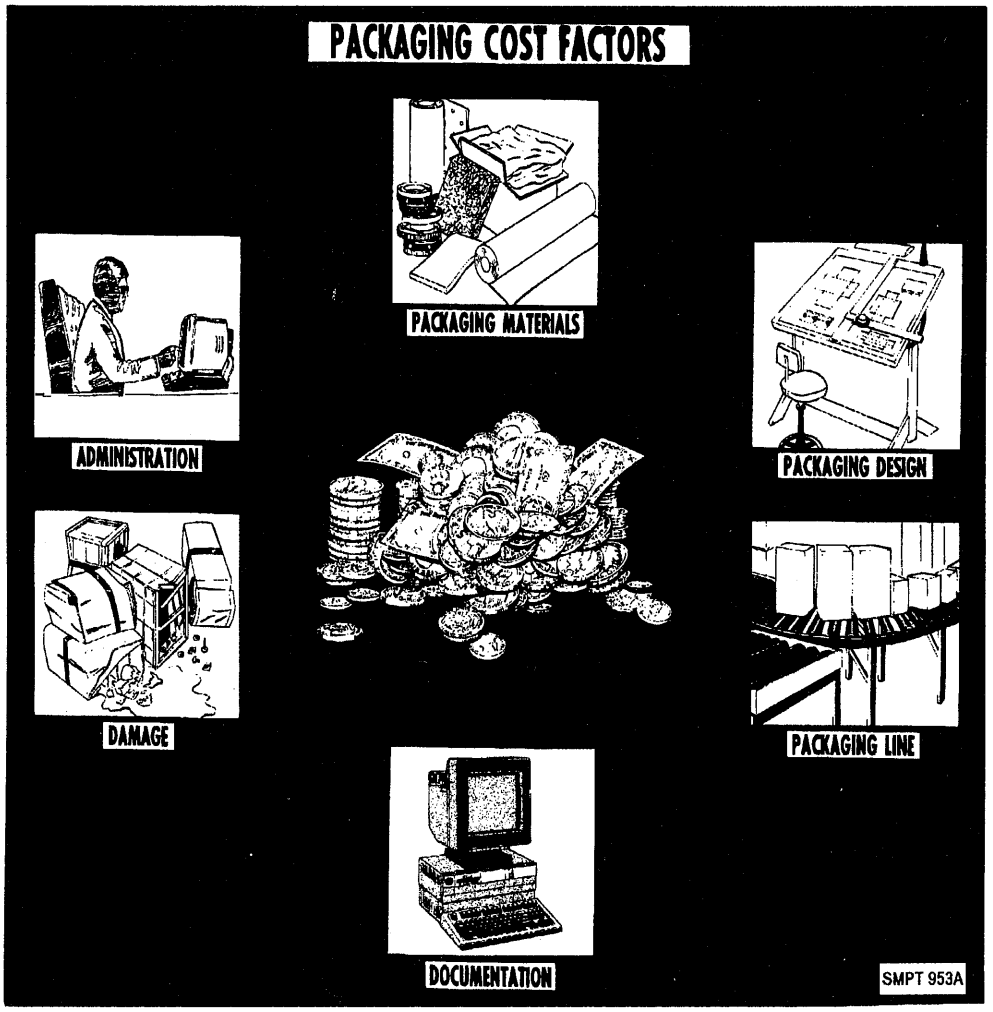


Figure 8-2

Packaging costs include--

- Under contract operation. The cost of labor and materials (including all applicable overhead charges, burden rates, and profit) required to package an item or group of items for shipment or storage. When the package includes reusable containers furnished by the shipper, the cost of the reusable components shall be considered to be their initial cost divided by the average number of reuses. In acquisition, packaging costs may be identified by individual line items or as a percentage of item cost which applies to a portion or all of the contract.
- In-house operations. The cost of labor and materials required to package and pack an item, or group of items, for shipment and storage.
- Actions based on an unwarranted level of protection at the expense of other elements of the distribution system will not qualify for reporting as cost reductions.

Realized and estimated savings to be reported in this area are those which result from the following, provided that the management action is withing the current year:

- More realistic requirements for use of preservation and packing material.
- Changes in packaging methods, production practices, or packaging materials.
- Increased operating efficiency at the administrative or production level.
- More accurate or realistic determination of packaging charges.
- Other actions which allow a reduction in packaging, costs.

Packaging cost reductions may result from actions by either the Government, including Government production facilities, or a qualifying contractor. Cost reduction may affect, or be affected by, operations at any stage from production design through provisioning, contractor delivery, distribution, and return shipment as retrograde material.

Packaging cost reductions may involve--

- Acquisition funds, when the packaging is performed by a contractor or Government production facility as part of the contract price.
- Transportation funds, when costs are reduced due to reductions in tare weight
- Acquisition funds, when the packaging is performed by a contractor or Government production facility as part of the contract price.
- Transportation funds when costs are reduced due to reductions in tare weight and/or cube of the packaged item.

Packaging cost reductions resulting from value engineering efforts will not be included in this area.

Cost reduction actions which should be reported but are not limited to the following:

- Making the item more rugged to reduce the amount of packaging needed to protect it through the distribution system.
- Reducing requirements for a costly material by substituting a less costly material, while still providing adequate protection.
- Packaging cost reduction resulting form review and renegotiation with the contractor.
- Management efforts which result in the reduction of manpower.

Measurement of savings are described in the following:

- Savings may be realized from new, improved or intensified actions implemented in any phase of the operation as stated above.
- Savings will be determined by making cost comparisons on an individual management improvement basis.
- The effect of transportation costs must also be considered in determining savings If transportation costs are reduced as a result of improvements in preservation or packing, these savings are also reportable. When transportation costs increase as a result of the reported improvement, these costs represent an offset cost.
- The "before" and "after" costs used in cost comparisons should be supportable from existing official records, documentation, and data which include, bur are not limited to, cost records, accounting records, payroll records, contracts, contractual change documents, performance and engineering standards, flight data, and performance test data.

PACKAGING COST CONTROL PROGRAMS

Packaging cost control programs in operation keep packaging costs fair and reasonable. The indefinite type packaging service contract can be used as a yardstick with which to measure proposed packaging charges.

In all acquisitions involving packaging where the proposed packaging expenditure exceeds a predetermined minimum figure, the bidder is

required to submit two prices for packaging: One for commercial packaging and one for the required military package.

The price for the military packaging is compared with the prices in the packaging service contract, adjustments are made to allow for additional transportation costs and service charges against the contract and, if the bidder's price is higher than the adjusted charge, it is recommended that the packaging be diverted from the bidder.

The contracting officer will consider this recommendation, along with other logistic requirements and, if feasible, procure the item commercially packaged and have it repackaged to the required level by the packaging service contractor.

Several services/agencies have adopted programs of this type. The contractor's services are available to any government agency desiring to make use of them.

Chapter 9

Contract Administration

PACKAGING SPECIALIST'S RESPONSIBILITIES IN CONTRACT ADMINISTRATION

Packaging specialists will participate in preaward surveys of prospective contractors to determine the firm's capability to provide the packaging services as required. Because of the broad scope and depth of packaging and materials handling requirements which are placed on a contractor by the commonly cited packaging specifications and standards, a firm's capability must not be taken for granted. Much of the loss and damage incurred by material arriving at oversea bases could have been pre-vented if the prospective contractor's knowledge and under-standing of military packaging had been given the roper technical evaluation during the preaward survey and necessary action taken to assure the technical accuracy of the prospective contractor's package engineering design and performance capabilities. When preproduction tests of package engineering design are required to be performed by the contractor, procedures should be in effect for submission of the required design data for approval by the cognizant packaging control activity, as required by the referenced specifications.

The technical evaluation of the prospective contractor's packaging capabilities and facilities should include the following elements:

- Technical knowledge evaluation of the prospective contractor's packaging, both general and specific to the commodity groups involved in the proposal.
- Training of key personnel in military packaging, especially Hazardous Materials.
- Availability of all current commercial, federal and military packaging specifications applicable to the proposal.
- Evidence of knowledge and/or experience in package engineering, design, test, application, evaluation, documentation, performance, and improvement, as appropriate for the scope and depth of packaging services required by the proposal.
- Availability and functional effectiveness of equipment, facilities and procedures for packaging and material handling as required.
- Evidence of knowledge and/or experience in package engineering design, test, application, evaluation, documentation, performance, and improvement, as appropriate for the scope and depth of packaging services required by the proposal.
- Availability and functional effectiveness of equipment, facilities and procedures for packaging and material handling as required.
- When packaging services are to be subcontracted, what procedures are affected for liaison to assure that the packaging form performs necessary planning and scheduling, both in the preproduction as will as production phases and has timely access to the information needed from the prime contractor? What procedures will be followed when packaging changes are proposed by the subcontractor for approval by the procuring activity?

Following the preaward survey, a report will be prepared by the packaging specialist as required by the preaward survey monitor. Information which reflects the need for postaward contractor orientation should the prospective contractor receive the award will be noted in the report for use in contractor

orientation, as appropriate. The packaging specialists evaluation will provide support for all items on the Pre-Award Survey Report (DD Form 1401) which pertains to the packaging and material aspects.

CONTRACT REVIEW

The Federal Acquisition Regulation (FAR) Part 42.5 states the policy, procedures, and responsibilities for postaward orientation of contractors. Arrangements will be made to assure review by Packaging Specialists of all contracts, purchase orders, subcontracts, pertinent changes, and shipping instructions to determine the need for further actions.

When the contractor does not or may not have a clear under standing of the scope of the contract, the technical requirements, it essential the Government initiate postaward orientation action to clarify contract requirements and resolve misunderstanding.

Several factors listed in FAR Part 42.502 have a relationship to packaging/materials handling:

- Preaward survey.
- Technical complexity of the packaging requirements.
- Urgency of delivery schedule.
- Past performance.
- Provisioning requirements (packaging aspects).
- Contractor's experience in military packaging.
- Extent of subcontracting (packaging).
- Hazardous materials.

On the agenda of a postaward orientation conference, FAR, Part 242.503-1 lists the following:

- Special contractual provisions.
- Clarification of specifications.
- Production planning.
- Packaging and shipping.
- Prime contractor responsibilities for subcontracts.

The review of contracts by packaging specialists serves essential purposes:

- Identifies new contractors and the packaging requirements placed on them so that the need for postaward contractor orientation may be determined and assistance provided as required before problems develop.
- Identifies new or different packaging requirements prescribed by acquisition activities which may demonstrate a need for coordination with the acquisition activities to establish needed uniformity.
- Identifies packaging requirements of a special nature which need emphasis or classification such as the special packaging and marking of hazardous materials as outlined in Title 49, CFR, Parts 100-199, defined as hazardous for transportation.
- Identifies contracts in which packaging requirements are obviously missing, erroneous, inadequate, or excessive for the level of protection specified. When a change in packaging requirements is determined to be appropriate, such change will be recommended by the packaging specialist in accordance with FAR, Part 10.004(E).
- Identifies contracts which require preproduction tests of engineered packaging designs so that necessary technical liaison may be established.
- Identifies contracts which require packaging data review and/or approval by packaging specialists.

- Participates in the evaluation of contractor's procedure to determine suitability of this inclusion in the DOD Single Process Initiative program.

POSTAWARD ORIENTATION

Postaward packaging orientation meetings will be scheduled with a contractor when preaward survey findings, contract reviews, or experience indicate the need for special indoctrination or instruction of contract's personnel in Government packaging requirements as they pertain to contracts.

Meetings will cover any anticipated deficiencies indicated in the SF 1403 (Preaward Survey) as will as general procurement policies in such additional areas as contractor development of packaging designs, preproduction pilot packs, special packaging delineation of packaging approval authority, acceptability of variations, weight and cube reduction program, packaging cost reduction program standardization of packaging methods and materials handling, change procedures, consolidation of shipments, packaging and handling of dangerous materials for Department of Transportation (DOT) and/or military or commercial air shipments, car loading, and damage control.

Whether orientation meetings are formal or informal, efforts will be made to establish an effective focal point in the contractor's organization for the resolution of packaging problems.

DATA APPROVAL

"Data" refers not only to preservation and packaging data developed under MIL-STD-2073-1, but to any preservation or packing requirements developed, revised, by packaging specialists where responsibility has been so delegated. It includes items such as Defense Industrial Plant Equipment (DIPE) items requiring special packaging designs, preproduction pilot packs or samples of containers, bracing, and blocking, or other similar devices. Where possible, DLA Form 528, (Packaging Requirements Code Worksheet) will be utilized to approve, clarify, or disseminate data.

When requested by the acquisition activity, a packaging specialist will review packaging data, pilot packs, specially designed containers, special cushioning, blocking, and bracing, and vehicle loading plans. Unless otherwise specified in the contract, packaging detail requirements will be coded in accordance with military standard MIL-STD-2073, Packaging Requirement Codes. Review may require visiting the manufacturer's facility to review the characteristics of items as defined on drawings, and by physically examining items to determine packaging and container requirements.

The fundamental objectives in reviewing packaging data is to assure standardization of packaging methods and detailed designs which will provide the necessary protection effectively, economically and in consonance with current DOD packaging policies, or to recommend contractor's packaging process when it will meet the customer's needs.

DEFENSE CONTRACT MANAGEMENT COMMAND

BACKGROUND

The Defense Contract Management Command is established within the Defense Logistics Agency as a major command responsible for Department of Defense contract administration support worldwide. As a result of the Defense Management Review, 902 recommendation, DLA assumed responsibility for all distribution depots, except ammunition and contract

management functions, worldwide, including former Services' in-plant (Plant Representative Offices (PROs)) operations.

On an exception basis, the Military Departments retain the administration of contracts for civil works, military construction, shipbuilding, and certain major weapons systems.

Contract administration is a technical and administrative service in support of buying activities and is performed at or near contractor establishments to facilitate contract performance and to assure compliance with terms and conditions of government contracts. Contracts are normally assigned to DCMC after award by the acquisition agencies. The technical and administrative services involve quality assurance, transportation, packaging, progress and status surveillance, on-site engineering services, timely delivery, and other functions essential for contract completion in accordance with specifications.

DCMC currently administers approximately 396,000 prime and support contracts with an estimated value of $2452 billion covering a broad spectrum of defense materials and services through nine Region Centers and 37 Management Area Offices as well as numerous Plant Representative Offices (DCASPROs). The principal functions of Defense Contract Management Command are (fig 9-1):

- Contract administration activities, such as financial analysis, review off contractor purchasing and estimating procedures, price and cost analysis, final determination of allowability of costs, administration of government property, disposal of excess and surplus contractor inventory, convenience termination settlements, and assuring compliance with terms, conditions and clauses of contracts.
- Production activities, such as performing pre-award surveys, monitoring progress of contractor's production efforts, expanding the Department of Defense Value Engineering Program, providing services related to labor. Standards and disputes obtain timely approval from procurement or packaging design control offices.

MANAGEMENT COMMAND

DCMC and industrial manpower requirements, performing industrial mobilization planning activities.

Transportation and packaging activities, such as reviewing adequacy of contractors' traffic operations, performing traffic management services, executing duty-free entry certificates, issuing and controlling movement documentation and review, and evaluating the adequacy and cost of preservation, packaging and packing in terms of DOD policies.

Engineering activities, such as review of the contractors' engineering design, development and production engineering efforts; performance of engineering and technical evaluations of contractor proposals; surveillance of engineering management systems, and evaluation of the use of engineering resources to meet contractual engineering requirements.

Quality assurance activities, such as product inspection and testing, evaluation and verification of contractors' inspection system or quality program detection of unfavorable quality conditions or trends, initiation of corrective action, and deter-mining whether the contractor has complied with contractual requirements.

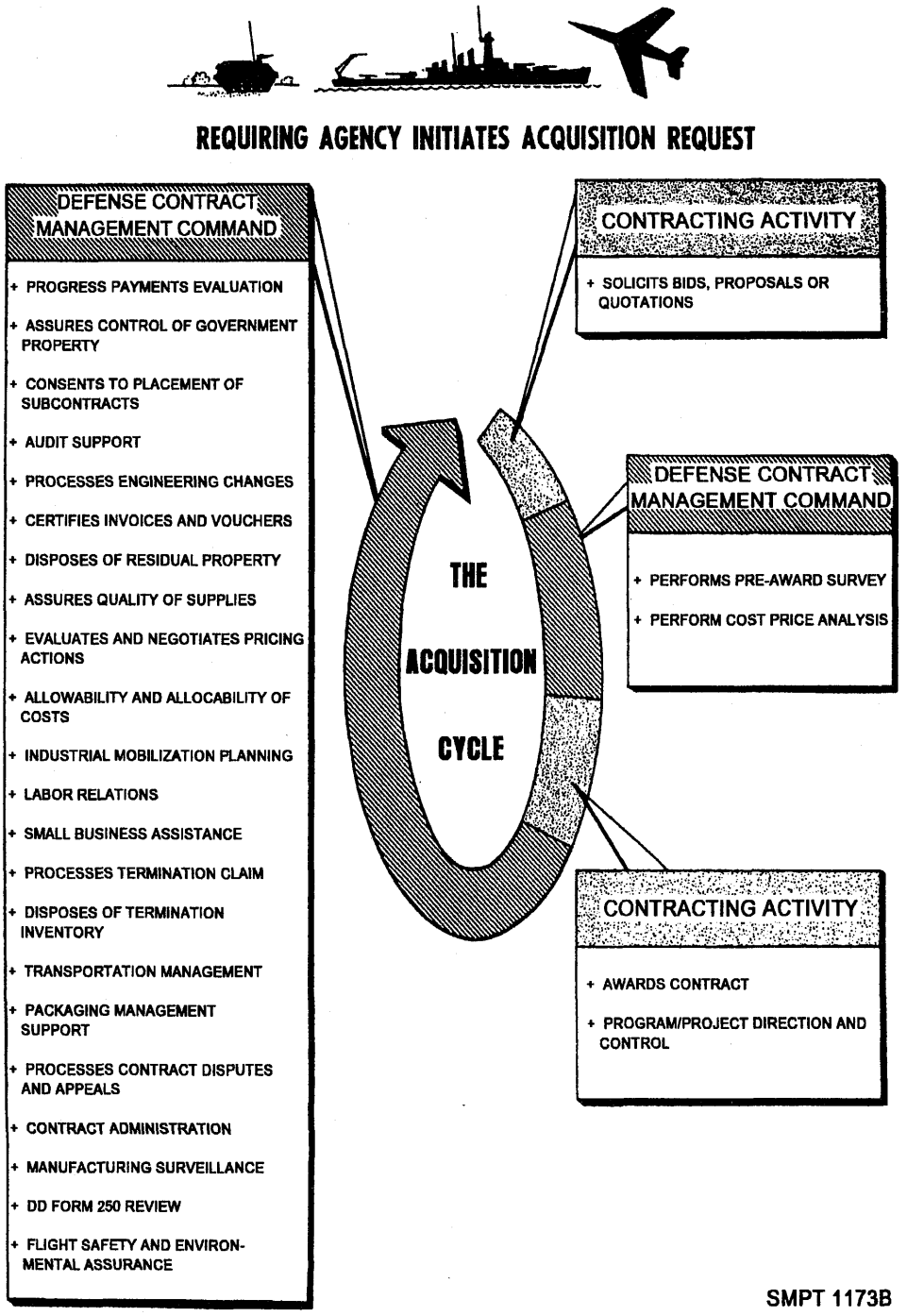


FIGURE 9-1. DCAS AND THE ACQUISITION CYCLE

Data and financial management activities, such as providing financial status and contract delivery status to procuring activities, inventory managers, and internal management.

Support to Small Business and Labor Surplus Area, such as determining contractors' compliance with the small business and labor surplus area mandatory subcontracting program, prime contractors' source development, counseling businessmen on government business.

ADVANTAGES TO THE CONTRACTOR

Establishment of Single Point of Contact for Contract Administration DCMC does away with multiple Government representation in contractor plants with the attendant overlapping and confusion which has existed in the past. A single Government spokesman acts as the focal point for the Department of Defense in its relationship with the contractor.

Application of Uniform Procedures. Multiple sources of policies and procedures with widespread divergences in methods, forms, organizations, and requirement levied on industry has been eliminated. Functional guidance is issued in single publications, minimizing the varying service interpretations of basic directives and instructions. Responsiveness to Government requirements has been sharpened and training programs simplified.

Reduction of Government Surveillance and Surveys. With the establishment of a single point of contract under DCASR, a great deal of needless repetition and multiplicity of Government effort in the administration of contracts are eliminated. Surveys conducted by several different groups of people in identical areas have been combined to bring about greater efficiency on the government side and less expenditure of time and effort on the part of contractors.

Decrease in government Controls Over Industry. The multiplicity of procedures established by the three services and DLA imposed requirements upon industry which were confusing and costly to administer.

Reduction the number of implementation directives decreased the controls now imposed on industry. Not only did this result in monetary savings but it promoted greater efficiency and mutual understanding.

Reduction in Operating costs. Defense contractors were faced with the necessity of responding to a bewildering variety of resident and itinerant contract administration personnel and widely divergent Government requirements. Through the merger of personnel and the establishment of more uniform requirements on the Government's side, the number of contractor people and monetary expenditures not devoted to meeting these demands can be significantly reduced with resultant savings both to Government and industry.

Reduction of Requirements and Greater Uniformity in Reporting. Multiple procedures and reporting requirements have been reduced and streamlined to accomplish the overall task more effectively. This is another advance which will save both industry and Government and great deal of time and money.

Chapter 10
QUALITY ASSURANCE OF PACKAGING

The basic quality-assurance concept of the Department of Defense is based upon MIL-STD-2073-1, Department of Defense Standard Practice for Military Packaging. The reader is strongly exhorted to consult the current MIL-STD-2073-1 for the latest requirements.

MILITARY PACKAGING DESIGN VALIDATION PROVISIONS

Unless otherwise specified in the contract or purchase order, the contractor shall be required to perform packaging design validation tests on selective and special group items in accordance with MIL-STD-2073-1 unless one of the following conditions exist:

- Furnished data - Detailed packaging instruction or design are furnished by the acquisition activity. This includes the predetermined codes to be used for common items.
- Previous test records - The contractor has previous successful test records for the same or similar item.
- Approved engineering data - The contractor has engineering data which has been approved by the cognizant DOD activity and indicates that the proposed packaging design will successfully meet the requirements of the contract.
- Multiplication containers - Items meet the weight, dimension and fragility requirements are packed in the appropriate multi-application container.
- Contractor shipping data - The contractor has historical shipping data confirming adequate protection is provided using the same or equivalent packaging.

Appendix F of MIL-STD-2073-1 outlines the procedure for conducting appropriate tests to validate specific military package designs when such testing is required. The information contained therein is intended for compliance, as applicable.

Except for hazardous materials package testing, packaging design validation tests shall consist of the following:

- The applicable performance tests of ASTM D 4169
- The applicable preservation inspections of Appendix G

The container shall be subjected to the tests specified for Distribution Cycle 18 of ASTM D 4169. Procedures as specified in ASTM D 4169 for Distribution Cycle 18 shall apply. The following assurance levels will be used:

- For Level A packs - Assurance Level 1
- For Level B packs - Assurance Level 2.

Preservation tests shall be in accordance with MIL-STD-2073-1.

Testing of hazardous material packages shall be in accordance with the applicable requirements for performance packaging contained in the International Civil Aviation Organization (ICAO) Technical Instructions, or the International Maritime Dangerous Goods Code (IMDG), and with the Code of Federal Regulations (CFR) Title 29, Title 40, and Title 49. These test results shall be documented as specified on the Contract Data Requirements List.

Ammunition unit load test requirements are stated in MIL-STD-1660.

QUALITY ASSURANCE PROVISIONS

Appendix G of MIL-STD-2073-1 outlines the appropriate quality conformance inspection tests to be conducted on all military packages subject to the provisions of the standard. Appendix G is a mandatory part of MIL-STD-2073-1. The information contained therein is intended for compliance, as applicable.

The contractor shall implement and maintain a quality system that satisfies program objectives and meets the requirements of ANSI/ASQC-9002 or an equivalent quality system model.

Due to the unique environment that packages are exposed to in the military distribution system, the current MIL-STD-2073-1 must be consulted to ascertain the required examinations and/or inspections that must be used in conjunction with the development of a quality system in accordance with ANSI/ASQC-9002.

INSPECTIONS

Following is a list of preservation inspections. Check the current MIL-STD-2073-1 for the required inspections.

- Leakage Test
  - Vacuum Retention Technique
  - Submersion (or Immersion) Technique
  - Pneumatic Pressure Technique
  - Hot Water Technique
  - Squeeze Technique (Applicable Only to Flexible Specimens)
- Heat-sealed Seam Test

Following is a list of inspections for packing deficiencies. Each sample intermediate or shipping container shall be visually inspected for any of the deficiencies listed below. Again, check the current MIL-STD-2073-1 for the required inspections.

- Container material(s) not as specified.
- Container construction not as specified.
- Container size not as specified.
- Closure material(s) not as specified.
- Closure locations not as specified.
- Markings incomplete.
- Markings illegible.
- Markings incorrectly located.

- Closure material(s) not as specified.
- Closure locations not as specified.
- Markings incomplete.
- Markings illegible.
- Markings incorrectly located.

Chapter 11
VALUE ENGINEERING

APPLICATION OF VALUE ENGINEERING IN PACKAGING DEFINED

In the DOD, value engineering (VE) is defined, with respect, to packaging, as a systematic effort directed at analyzing the functional requirements of packaging systems, equipment, facilities, procedures, and supplies for the purpose of achieving the essential functions at the lowest total cost, consistent with the needed performance, reliability, quality, and maintainability.

Although there are numerous other published definitions of VE, most are merely minor variations of this definition and none appears to contradict it. Value Engineering is the term used by the DOD in its publications and in its contracts. Others may refer to their value improvement efforts by such terms as Value analysis, Value Control, or Value Management.

In a narrow sense, to differentiate value analysis from value engineering, the former is the analysis made on an existing design to effect cost reduction and improve performance

VE IN PACKAGING ENGINEERING

Packaging operations are especially susceptible to the application of value engineering techniques because of the continual Introduction of new packaging materials, and also because items are being constantly improved, requiring continuous scrutiny of their packaging requirements.

TECHNIQUES OF VALUE ENGINEERING

Value engineering is usually performed in six successive steps or phases--

- Information phase. The purpose of this phase is to gather and tabulate data concerning the item, to determine the item function, and to evaluate the function.
  - o The accuracy of this information is imperative, since it is the basis for subsequent decisions.
  - o The determination and evaluation of the function are the most important elements in a value analysis, since they are the elements through which the same or better performance may be achieved at less cost.
- Speculative phase. During this phase alternate methods for providing the item function are generated.
  - o This is the creative part of value analysis, sometimes called "brainstorming".
  - o "Brainstorming" is defined as the combined effort to two or more individuals to determine, without judicial evaluation, all the methods of performing the necessary functions, without inventing new processes or contrivances.
- Analytical phase. The purpose of this phase is to develop the alternate methods listed during the speculative phase, listing the advantages and disadvantages of each.
  - o The dollar value of each method is either estimated or computed.
  - o The methods which offer the greatest potential cost savings are then selected for further study.

- Program planning phase. In this phase, the value engineer establishes a program of investigation for study of alternate methods.
  - o Vendors are contracted for specific material, process, and cost data. Solutions to the problem are discussed with the product engineer, with whom suggestions and opinions are interchanged. If the problem concerns packaging, the packaging specialist will be consulted.
  - o The cost of each of the solutions is refined, taking into account quality assurance, packaging, and transportation and a determination is made of a "best" and an "alternate" recommendation for the combination of basic functions.
  - o The cost of these recommendations, best and alternate are compared with the value goal by computing the percent of accomplishment.
- Program execution phase. The purpose of this phase is to gain firm information concerning the alternate methods. This is the most important administrative effort of the value engineering program. The preparation of the proposal has an important bearing on the acceptance of the submitted recommendation. The report should be in three parts.
  - o The value engineering recommendation sheet, with accurate concise data.
  - o Simple sketches, clearly depicting the proposed changes.
  - o Copies of pertinent brochures or informal quotations. All cost figures used for comparison purposes must be based on like production or procurement quantities.
  - o The narrative of the proposal should include any significant reasons for accepting the proposal in addition to savings which may be realized.
- Presentation and follow up phases. During this phase, a report is prepared, issued to the decision maker, and necessary action is taken to assure acceptance of the proposal prior to any acquisition commitments for the project item.
  - o Upon completion of the formal proposal, it is routed through proper channels to the cognizant organization for approval and implementation. A copy of the recommendation sheet is furnished acquisition personnel as a matter of interest and information.
  - o An efficient follow up system in the value engineering activity, to simplify control over projects pending approval, is important since savings on current acquisitions is only realized through timely coordination between approval and acquisition.

The techniques, key questions, and tests for value are listed in the Value Engineering Flow Chart (see table 11-1).

These interrelationships serve as a guide in developing data during each phase of the value analysis job.

For specific applications, the value engineer may select part of the techniques, illustrated, or may develop additional ones form suited to a particular project.

Table 11-1. Value Analysis Flow Chart

Value analysis job plan	Techniques	Key questions for value	Ten tests for value
1. Information Phase Purpose:			
a. To gather and tabulate data concerning the item	Use better human relations. Overcome roadblocks. Get all the facts. Bring new information. Get information from best sources. Get dollar on key tolerance		Does it use contribute value? Is it made on proper tooling, considering quantities involved? Does material, reasonable labor, overhead, and profit total its cost?
b. To determine the item function.		What is it? What does it do?	
c. To evaluate the function.	Evaluate the function. Evaluate by comparison	What does it cost? What is it worth?	Does it need all of its features? Is its cost proportional to its usefulness?
2. Speculative Phase Purpose: To generate alternate methods for providing the item function.	Blast--Create	What else will do the job?	Is there anything better for the intended use? Can a usable part be made by a lower-cost method? Can a standard product be found which will be usable? Will another dependable supplier provide it for less? Is anyone buying it for less?
3. Analytical Phase Purpose: a. To develop alternate methods generated during the Speculative Phase listing advantages and disadvantages of each.	Refine Use the companies' services.		
b. To estimate the dollar value of each method.	Put dollar on main ideas. Use shop cost.	What does it cost?	
c. To select methods which offer the greatest potential cost savings.			
4. Program Planning Phase Purpose: To establish a program of investigation for study of alternate methods selected in the Analytical Phase	Work on specifics not generalities. Spend company's dollar as you would your own. Plan to--- Use standards. Use specialty products and materials. Use specialty processes.		
5. Program Execution Phase Purpose: To gain firm information concerning your alternate methods.			
6. Presentation and Follow up Phase Purpose: a. To prepare a report. b. To issue the report to the decisions maker. c. To insure that proper action is taken.			

Note. The above interrelationships of the techniques, questions, and tests, to the job plan were developed for your benefit. You may have your own ideas of what the relationships should be.

Caution. **For clarity, each technique, question, and test is recorded only once in relation to the job plan. In actual usage these items would be repeated several times as various phases of the job plan are accomplished.** AREAS OF APPLICATION

A few of the several methods of identifying areas where value engineering can be applied most profitably include--

- Reports which indicate a high scrap or rework rate. This would indicate a prime field for value engineering, since any improvement would reduce costs significantly.
- Acquisition problems, such as sole source of supply and past due deliveries. The application of value engineering to these problems would be invaluable.
- A history of frequent redesigns and engineering modifications associated with an item. If the application of value engineering techniques can finalize the development of an item, the potential savings in engineering costs would be very worthwhile.
- Observation in the manufacturing areas. Very often the critical observer can see where improvements can be made in operations, whereas the operator is too involved in his tasks to see the whole picture.
- Discussing the latest development and various products with the vendors. This is a prime source of information on new materials and techniques.
- Reviewing trade magazines and publications of professional societies. This is another source of information on new materials and techniques which may be found useful

VALUE ENGINEERING IN ACQUISITION

The inclusions of the value engineering clauses in acquisition contracts is now the policy of the Department of Defense.

With the exception of those contracts listed in the Federal Acquisition Regulation (FAR), value engineering clause shall be included in all fixed-price-type and cost-plus-incentive-plan contracts on $100,000 or more, that incorporate firm specifications, unless the head of the acquisition activity has determined that value engineering has no potential for cost reduction as to the item or class of item being acquired.

Value engineering incentives may be included in contracts of lesser value at the discretion of the contracting officer.

VALUE ENGINEERING INCENTIVE CLAUSE

The value engineering incentive clause sets up a formula by which the contractor and the Government share any savings resulting form this program. The precise extent to which the contractor should share in cost reduction must be tailored to the particular procurement situation.

Normally, the contractor's share in any cost reduction shall be 50 percent of the amount by which the contract price is reduced as a result of the adoption of the cost reduction proposal, but in no event shall the contractor's share exceed 75 percent.

A value engineering program requirement with incentive in that it will be stated in the contract as a line item.

It is a contract provision that obligates the contractor to engage in a program requiring a specified level of value engineering effort, and in addition, provides for the contractor to share in cost reductions resulting form proposal submitted by the contractor and adopted by the Government.

It is generally desirable to limit the use of value engineering program requirements with incentives to cost-plus-fixed-fee contracts. In this type of contract, where the Government reimburses the contractor for allowable costs, the contractor shall not share in the adopted reductions until such reductions exceed the Government funding by an amount specified in the Federal Acquisition Regulation.

This part of the FAR also sets dollar limits, which increase with contract value, on the amount of Government funding, including labor, material, and overhead for a required value engineering program.

This document also sets up the procedure for submitting and evaluating cost reduction proposals.

APPLICATION OF VALUE ENGINEERING TO PACKAGING

Packaging, which is considered to be the bridge between the production and distribution cycles, is a factor in most value engineering projects.

In some cases, packaging requirements may undergo change because of value-engineered improvement in the item; while, in other cases, the packaging itself might be the subject of the value analysis.

The packaging specialist may be classed upon for technical advice by the value engineer. In these instances the packaging specialist must be alert to the possibility of employing new materials or techniques to achieve adequate protection at minimum costs.

PACKAGING COST VS. RELIABILITY

One of tests the value engineer may apply to packaging is to measure the cost of the package against its reliability.

Packaging cost includes the cost of labor and material (including all applicable overhead charges, burden rates, and profit) required to package an item or group of items for shipment or storage. It also includes the cost of transporting the tare weight of the shipment at the rate which applies to the packaged item.

Reliability reflects the length of time the package will continue to afford the required protection.

By plotting the costs of alternate methods of packaging on a graph (fig 11-1) against the reliability of the packages, and also developing a curve based on reliability and the cost of maintaining reliability, the value engineer can analyze the ideas produced during the speculative phase of the study.

In a general way, the cost of the packaging will vary with the reliability, as shown in curve A. As reliability approaches 100 percent it takes an increasingly greater increment of cost to achieve a given increase in reliability.

On the other hand, the cost of maintaining the protection given by the package, including the cost of repackaging when necessary, decreases as reliability increases, as shown by curve B.

Adding these two curves together we achieve curve C, which represents total cost. We can immediately recognize the minimum cost as the lowest point of the curve.

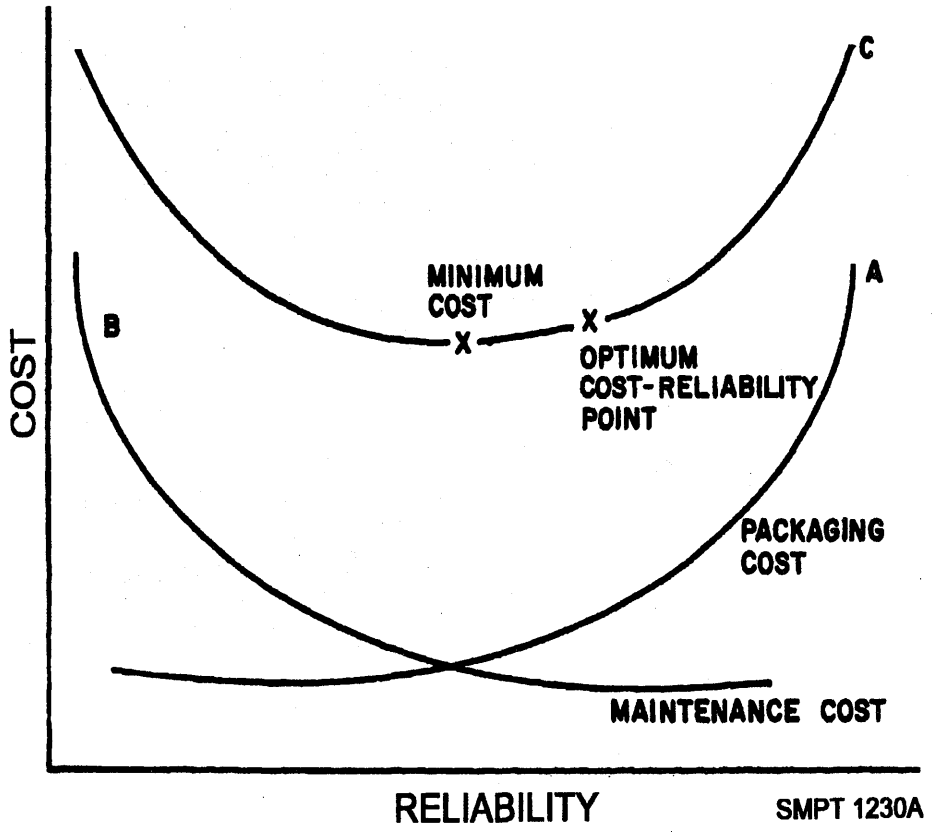


FIGURE 11-1. COST VS. RELIABILITY CURVES.

However, because the slope of the curve at this point is very slight, it is evident that a substantial increase in reliability can be achieved at very little additional cost. This is the optimum point which the value engineer will endeavor to reach as a result of his work.

A project completed by value engineers at Watervliet Arsenal, N.Y. is an excellent example of how the techniques of value analysis can achieve significant cost reductions in packaging (fig 11-2).

The subject of the study were the shipping containers used to transport 8-inch howitzers for the arsenal to Aberdeen Proving Ground, MD. The material cost of the prototype container was $75 and labor cost (including burden) was $212.63 for a total cost of $287.63. Two hundred and seventy containers were required under the contract for a total projected cost of $7,460.

During the speculative phase four ideas were presented: the use of straps, sweeps, and modified container, and a rack.

In the analytical phase, the use of sweeps was considered the "best" method, with the modified container as an alternate.

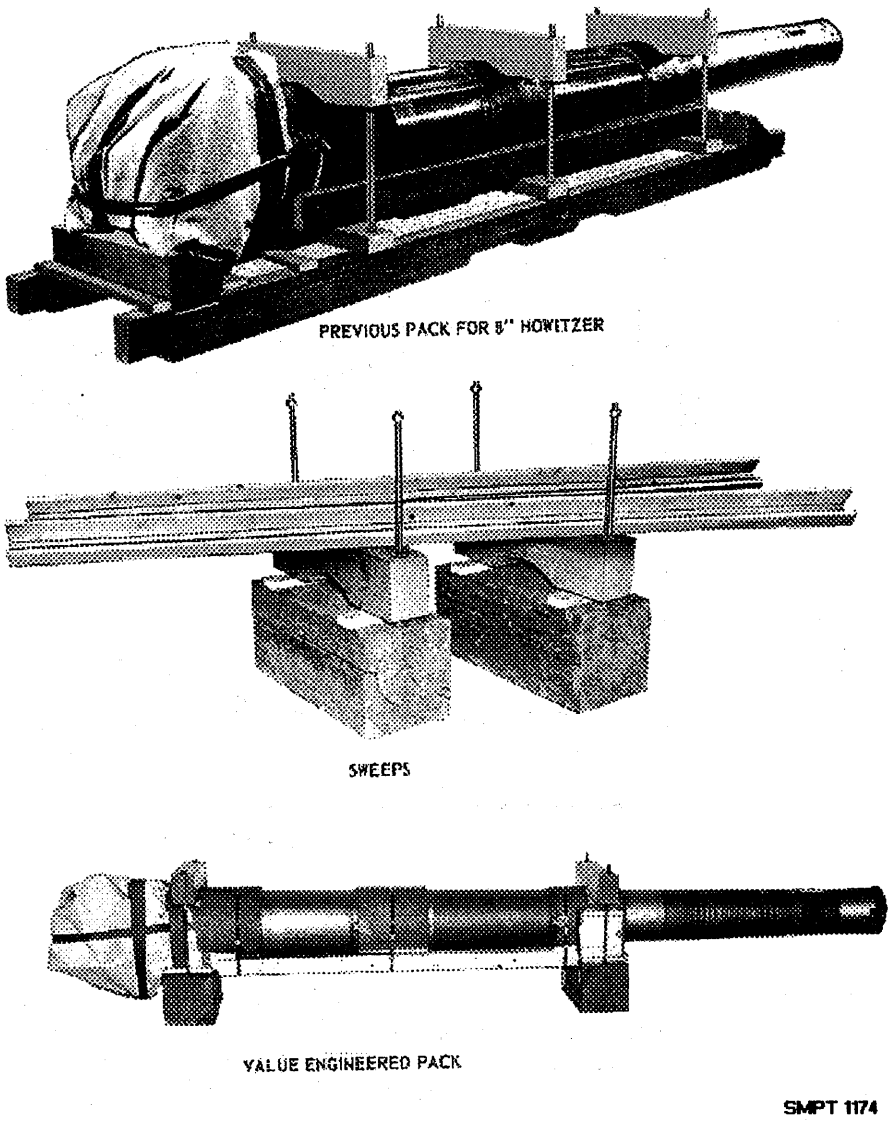


FIGURE 11-2. MODIFIED PACK FOR 8-INCH HOWITZER

In the program planning phase of the project, it was decided to have prototype sweeps made; mount the gun on these sweeps, with supervision form the design engineers to assure proper positioning; and to make a trial shipment to Aberdeen Proving Ground, following up on the shipment to discover problem areas, if any, and to solve these problems before submitting the project.

This program was executed as planned. The material cost of the sweeps was $25 labor (including burden) $54, for a total cost of $79. An additional $100 was charged to the entire job order for tools, making a total cost of $21,430.

The cost reduction achieved for the order was $56,030 with additional savings to be realized o future orders, and also by applying this modified packing technique to other size weapons, such as the 175mm gun.

CONCLUSIONS

From this example and from many others which have been developed by all the services, it can be seen that the application of value engineering techniques to packaging is rewarded by substantial savings far in excess of the cost of the value analysis

The packaging specialist, as a consultant to the value engineer in this area, makes important contributions to the program.

Chapter 12
Transportation and Packaging

EFFECTS OF PACKAGING ON TRANSPORTATION CHARGES

Although perhaps an over simplification, packaging can be thought of as preparing the item and placing it in a suitable container to which transportation attaches wheels and moves it to destination. Storage then becomes interrupted transportation.

Many people think of packaging as the end of the production cycle; this is not entirely true. Packaging should also be thought of as the beginning of the distribution cycle and, in turn, as an integral part of transportation. The package accompanies the item from the end of the production to the ultimate consumer; it is the only thing that stands between the item and the harmful effects of physical and environmental forces encountered during distribution.

Transportation is by far the greatest factor in the distribution cycle. This includes the movement from the plant to the transportation vehicle to the storage point, and from the storage point to the consumer. Preservation and packing must be adequate to protect the item during this multiple handling and movement and, at the same time, must be minimal in tare weight and cube so that a minimum about of transportation funds and equipment are spent on moving the packaged item.

Traffic management deals with the efficient and economical procurement of transportation service. Traffic managers are generally responsible for selecting modes of transportation, routing shipments, analyzing the costs of moving freight, and reducing such costs wherever possible and practicable. This chapter presents enough information about freight transportation without going into the details of traffic management to enable logistics personnel to understand how efficient packaging and carefully planned packaging requirements can assist the traffic manager in filling his responsibilities; it is also intended to show the effect that traffic manager's decisions often have on military packaging

MODES OF TRANSPORTATION

The distribution of material throughout the United States and around the world is one of the nation's largest and most vital industries. The military is vitally concerned with the nation's transportation system since it is used to carry military material to CONUS installations and to aerial and water terminals for transshipment overseas. In addition to domestic commercial carriers, the military services use foreign common carriers and military carriers.

At the present time seven basic modes of transportation are available to the military. These modes are-

- Rail.
- Highway.
- Air.
- Water.
- Pipeline.

- Pack animals.
- Pack men.

Pack animals and men normally are used only in areas where no other means of transportation have been developed or where the other transportation systems have been destroyed by combat or guerrilla action. Pipelines constitute a highly specialized transportation system currently limited primarily to the movement of petroleum, petroleum products, and natural gas. The other modes offer a great variety of transportation equipment and services to the shipper; these modes are also the ones most commonly utilized by the military.

Rail Transportation

This is an important mode of transportation utilized by the military services today. Railroads are especially suited for long-distance overland movement of large quantities of material. Rail-road equipment is available to move almost every type of item from repair parts to heavy tanks, from poultry to livestock, and from items requiring refrigeration to those requiring heat. Furthermore, railroads are usually unaffected by extremes in temperatures and weather conditions. There are a number of disadvantages of rail transportation, including the ease of disruption by physical failure due to a railroad accident or enemy action of all types, reduction of flexibility because of fixed facilities, and time-consuming transfers of freight and freight cars.

The operations of domestic railroads are regulated by the governmental elements: The Department of Transportation (DOT) has jurisdiction over safety matters and the Interstate Commerce Commission (ICC) continues to regulate economic matters such as operating authority and rates for interstate traffic, although its power has been greatly reduced since deregulation. Intrastate traffic is regulated by State Regulatory Commissions. The railroads have joined together to establish the Uniform Classification Committee and have issued a Uniform Freight Classification which, in addition to being an agreement as to how commodities will be classified for rate setting purposes, also sets down the rules by which the railroads will accept goods for transportation. The DOD Code of Federal Regulations (CFR) Title 49, Parts 100 to 199, sets forth the rules and regulations by which hazardous materials may be carried by rail.

Highway Transportation

The other mode of transportation frequently used within the United States is motor transportation. Motor freight service is rapid for comparatively short distances because of the availability of direct routes and the avoidance of lengthy terminal delays. Trucks, by their nature, can offer far greater flexibility than rail modes. Modern truck fleets offer great flexibility of equipment, schedules, and material tracking processes. They do not rely on sidings, rights-of-way or other impediments. Use of dedicated truck reduces cost and increases customer support from depot to military activity.

Interstate motor carriers are also regulated by the ICC and DOT. Intrastate motor carriers are also regulated by the ICC and DOT. Intrastate carriers are regulated by State Regulatory Commissions. In addition, the National Motor Freight Association publishes National Motor Freight Classification. CFR Title 49 details rules and regulations by which hazardous materials may be carried on the highway.

Water Transportation

Water transportation is utilized for all types of cargo but is especially useful for transporting bulk and liquid cargoes, troops, and large volumes of military supplies to oversea theaters. Although inland water transport is limited to areas served by water facilities, ocean shipping is extremely flexible in its operating radius in that it can reach any part of the world that has harbors or good beaches. Vulnerability to air and naval action during hostilities is an important disadvantage of this mode of transportation. Intermodal transportation concepts have had even greater effects with the introduction of the SEAVAN. SEAVAN has become a significant method of transportation.

The ICC regulates domestic interstate water transportation and the State Regulatory Commissions regulate intrastate water transportation. Foreign water transportation, regulated by the Federal Maritime Commission, is effected between the ports of the United States and the ports of other countries through the Great Lakes and/or the St. Lawrence Seaway or the ocean/gulf water routes. The rules and regulations for special requirements governing the transportation of military explosives and hazardous munitions or parts on board vessels are established by the United States Coast Guard. The International Maritime Dangerous Goods (IMDG) Code contains the rules and regulations by which hazardous materials may be transported by water.

Air Transportation

Where speed in delivery is required, air transportation is generally the most desirable mode. Because air carriers are able to reach any part of the world in the shortest possible time, they have rapidly evolved as an important part of our transportation system for moving both materiel and personnel. Some current disadvantages of air transportation are high freight costs, limited number of communities and industrial areas reached directly by air, and restrictions on the size, weight, and configuration of cargo.

The regulating agency for the air carriers is the Department of Transportation. The Air Transport Restricted Articles Tariff and the Restricted Articles Regulations of the International Air Transport Association are documents which classify and set forth the rules for shipment of hazardous materials by commercial air.

Relationship Between Packaging and Transportation Costs

Freight Classifications Rates

Freight classification involves the division or grouping of the thousands of articles shipped into classes according to various characteristics and assigning a numeral to each class. This numeral is known as a rating. All items grouped in the same class have the same rating. These classes are called classifications. Classification is the first recognition of an item in transportation terms; from this initial recognition evolves the processes for establishing charges for the movement of material between specified points.

There has been a long, steady growth of freight classification based on experiences of carriers, customers of the carriers, and Government-regulating agencies. From the early days of turnpikes and canals, when transportation companies separated articles into two classes which were dependent upon the size and weight of the shipping package, there are now approximately ten thousand differently numbered descriptions for articles in the railroad freight classification. Considering the impracticality of fixing a

separate crate for each article shipped, the need for a system of grouping commodities is obvious. The carriers have developed a variety of factors which affect the transportation of an article, and have progressed through a series of territorial classification tariffs on two predominant classifications, one for rail and the other for motor transportation.

With all articles grouped into a limited number of classes, each of which is assigned a rating, a rate is set for each class and all items in a particular class have the same freight rate. The difference between a "rate" and "rating" is an important one in the area of freight classification.

Rate. A rate is an actual dollar and cents charge per unit of weight, per mile, etc. For example, $2.80 per hundred pounds to transport material between two specified points. These dollar charges are published in rate tariffs.

Rating. The rating of a group of articles indicates the class to which those articles have been assigned for classification purposes. It does not fix the charges in dollars and cents for moving material, but it does designate a percentage of the first-class rate. For example, if the first-class rate is $2.80, a rating of 85 (or class 85) would be $2.38 (85 percent of $2.80).

Freight classifications do not normally publish "rates"; instead, they publish "ratings" which must be used in conjunction with rate tariffs. The National Motor Freight Classification publishes ratings which range from class 35 to class 500 (five time first-class), and the Uniform Freight Classification publishes rating which range from class 13 to class 400 (four times first-class). Freight classifications provide for two different ratings expending on the weight of the quantity of an item as it is packed for shipment.

Carload (CL) or truckload (TL) ratings. The rating applied to a shipment which meets a specified minimum weight.

Less carload (LCL) or less truckload (LTC) ratings. The rating applied to a shipment which does not meet a specified minimum weight.

There are many cases where different ratings are applied to the same item depending on how the item is packed for shipment. As an example, consider the Uniform Freight Classification ratings for paint-spraying booths.

Description	LCL Ratings	
Set up in boxes or crates	200	85
Knocked down, other than flat in boxes or crates	150	85
Knocked down, flat	70	372

Freight classification factors. There are many factors involved in placing an item into a class and assigned it a rating. Some of the more important factors are listed in figure 12-1.

Freight classification rules and regulations. In addition to giving a description of articles, their classification, and their package requirements, the freight classifications also list numerous rules and regulations governing the manner and form of a shipment from its initial preparation to its delivery at destination.

Some of these rules are highly technical and, in some instances, have legal implication. Other rules are interpretive or describe conditions under which different ratings will apply; these rules can be either a condition under which the shipment is offered to the carrier or the physical condition of the commodity as prepared for shipment.

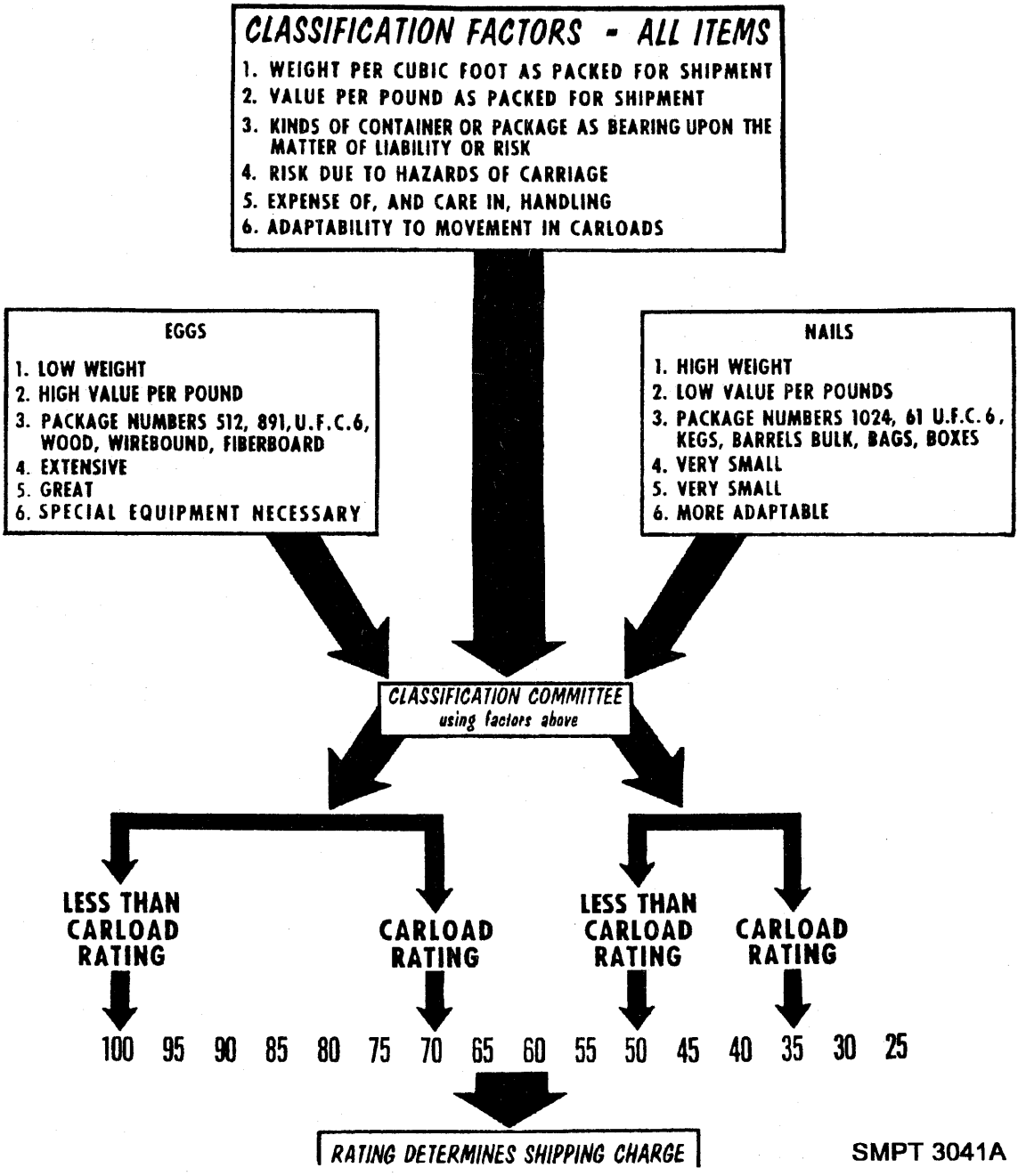


FIGURE 12-1. FACTORS IN TRANSPORTATION COSTS

Whereas the classification of articles also provides the authorized methods for preparing these articles for shipment, i.e. loose, in crate, bundles, bales, boxes, etc., the rules provide penalties for shipment which do not comply with the requirements as to preparation for shipment. In some cases, articles offered for transportation may be refused for shipment unless they are in such condition and so prepared for shipment as to render transportation reasonably safe and practicable.

One rule provides that if differently rated items are mixed, the total weight will be charged on the basis of the highest rated article within the pack. Another rule covers all ICC regulations for shipping materials in fiberboard boxes, explaining how certain materials are packed, size of containers, bursting strength of fiberboard, methods of closure, etc.

Preservation, Packing, and Transportation costs. A close examination of the factors in figure 12-1 will show some obvious, and some not-so-obvious, ways by which the packaging and packing of articles play an important role in the overall determination of transportation costs. These factors should be considered when selecting packaging materials and processes.

- Weight per cubic foot.
  - o A railroad car or motor truck loaded to its capacity in pounds can earn more revenue than one which is loaded to only a fraction of that capacity. Similarly, light, bulky items take up more earning space than items which are heavy in proportion to the space occupied. The only way the carrier can earn enough revenue to cover the cost of transporting the light, bulky items is to give them a higher rating.
  - o The same principle applies to the practice of giving higher ratings to articles which are "set up" (i.e., assembled in their final form) in comparison to the lower ratings given to the same articles when "knocked down" or "nested" (enclosed one within another as pails, bowls, etc.).
- Kinds of container or pack as bearing upon the matter of liability or risk.
  - o The better an item is protected and cushioned against damage during shipment, the less risk the carrier takes in accepting the item. There are many cases where the same article has different ratings when packed in different kinds of containers. For example, sulfuric acid has four ratings in addition to the rating for shipping by tank car.

Description	LCL Ratings	CL Ratings
In carboys, other than package 800	100	40
In glass in barrels or boxes	70	40
In package 800	70	35
In metal barrels	60	30

It should be pointed out that the Uniform Freight Classification contains a section which identified and describes hundreds of different types of packages; in the above case, package 800 is a special type of carboy. Where alternative containers are offered, the carriers encourage the use of the more protective containers by assigning them the lowest ratings.

- Risks due to hazards of carriage. In addition to the kind of container used, it is generally found that items which are inherently subject to being easily damaged are given higher ratings than the more rugged, sturdy items. Ratings on those items which are quite easily damaged should be lowered either when improvements are made in the design of the item or when new packaging materials and methods are developed to afford better protection to the item. In addition, carriers also take into consideration the possibility of the item damaging other freight or equipment.
- Expense of, and care in, handling. Most items which are considered as a high risk due to their susceptibility to damage also need greater care in handling; this may require either more time in handling or special equipment for handling. In either case, this means increased costs to the shipper. Once again, improvement in the designer, these items and/or improvement in packaging and packing methods for these items should result in lower ratings.
- Weight and cube of packaging and packing materials. If minimum weights are met, it is quite obvious that the heavier the packed item and the greater the amount of space it takes, then the greater will be the cost for shipping then item. For example, if the a delicate missile component weights three hundred pounds and the shipping container weighs one hundred pounds, the entire shipping charges will be based on four hundred pounds at the rating applied to the missile component itself. More details will be presented later in this document.

EFFECTS OF MODES OF TRANSPORTATION ON PACKAGING

This manual pointed out that the military service documents implementing packaging policy list several factors to be considered in determining appropriate levels of preservation and packing; one of these factors is the mode of transportation involved. Acquisition document should, whenever possible, provide specific details on how items are to be prepared for shipment by a particular mode of transportation.

Contracting officers, packaging specialists, and requirements specified in commercial carriers' regulations, statutory requirements, and military directive and regulations. Packaging personnel and design engineers should also be familiar with the hazards and handling conditions which items will encounter when shipped by various means of transportation.

HOW MODES OF TRANSPORTATION AFFECT PACKAGING

Some general advantages and disadvantages of the various means of shipping material were presented earlier in this chapter. There are, however, other factors which should be considered in determining how much protection an item needs during shipment.

- Rail transportation.
  - Railroads are excellent for mass movement of heavy materials and reach almost all communities and industrial areas. Closed cars afford protection against the elements, and special cars afford heat, refrigeration, or ventilation as may be desired. On the other hand, freight is often subjected to damage from shock due to "bumping" at freight yards and sudden starts and stops; constant vibration during shipment is another cause of damage. All shippers and receivers do not have railheads; this means additional handling in transferring freight by truck to the rail terminal is required.

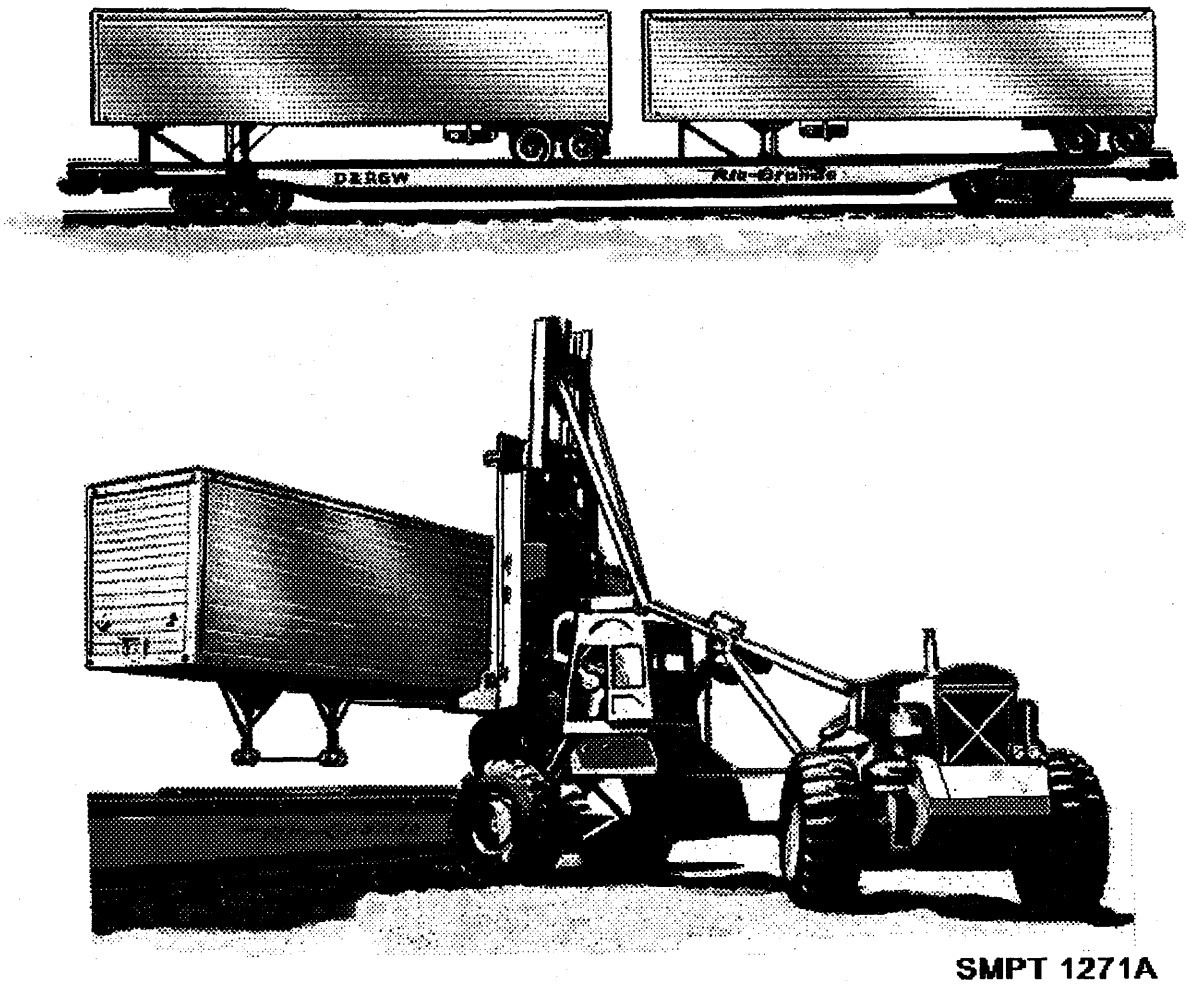


FIGURE 12-2. TRUCK TRAILER PIGGYBACK AND FORKLIFT

- Two widely used innovation to rail transportation are containerized freight shipments and trailer-on-flatcar (TOFC) or "piggyback" service (figure 12-2). Both types of service tend to speed up service and decrease the amount of freight handling required.

- Railroads also offer in-transit stop off privileges, an special service whereby the shipper may have a shipment stopped at one or more points between the origin and final destination for storage or further processing and then reshipped to destination at the lowest rate in effect from the initial point of origin to the final destination plus a small transit fee. This would permit purchase of material from a contractor, shipping it to another place for any additional processing or packaging and packing, and then forwarding it to its destination.

- When it is considered necessary to prescribe particular carloading methods in invitations for bids and requests for proposals covering the purchase of supplies, or in related transportation or packaging specifications, the required methods shall be specified in adequate detail. There are numerous detailed loading plans designed and tested for use with shipments of ammunition, explosives, or other dangerous articles. Heavy or difficult loads must observe American Association of Railroads (AAR) requirements.

- Highway transportation. For shorter distances, motor trucks often provide faster and more convenient service than railroads. Motor trucks usually provide door-to-door service with little or no interchange or freight between carriers; this reduces the possibility of loss or damage resulting from repeated loading and unloading. The motor truck, moving as an independent unit, and therefore, not subject to the rigors of coupling and humping as are railcars, permits less costly expenditures for loading and unloading, packing, dunnage, and bracing. The fact that trucks are not loaded as heavily as railcars, also contributes to the existence of less stringent and costly packaging requirements. On the other hand, in order to provide door-to-door service, particularly in oversea areas, trucks must frequently use secondary and rough roads, thus increasing the chance for damage to occur.
- Water transportation.
  - Although water transportation is usually the cheapest means for shipping material, it is also usually the most widely used method for shipping most of our military material to oversea areas. As long as cargo aboard ship remains secured, there is relatively little shock or impact involved, but this favorable condition often is offset by the fact that some other means of transportation are usually involved in getting freight from the shipper to the water terminal and ten from the water terminal to the consignee; this, in turn, increases handling costs and the possibility of damage. Depending on how and where material is stored, water and salt spray could cause considerable damage.
  - Among the more promising developments in transportation are the container ships. Specially built containers (SEAVANs), which can be loaded on flatcars, attached to trailer chassis for over-the-road hauling, and loaded aboard ship, educe the amount of handling of the packages to a minimum. SEAVANs in conjunction with the container ship, have revolutionized ocean transportation. SEAVANs protect the material form origin (source stuffing) through to final delivery. Modern ports can load/unload a container ship within 24 hours. Containerized loads suffer reduced pilferage and less weather damage susceptibility. When combined with smart cards and the like, they also improve accountability for shipper and receiving activity.

- Air transportation.
  - Car must be taken that containers are not used which will be damaged by internal air pressure at high altitudes and that cushioning materials will not freeze when exposed to the low temperatures found at high altitudes. While very little protection is required during air shipment, it must be kept in mind that, in most cases, material must be carried to and from air terminals by some other means of transportation; once again,

this involves more handling and greater risk of damage. In this sense, preparation of freight for air shipment is a paradox--on one hand, it is desirable to have as little weight and cube as possible; on the other hand, once the material is removed from the airplane, it may require a great deal of protection during the remaining part of the trip to its final destination.

- o Many activities publish policy documents and guidelines for determining which levels of protection and what methods of preservation should be applied to items depending upon destination, means of transportation, and intended use. Such documents are not intended to serve as hard and fast rules in all cases; instead, known conditions to be encountered and information obtained form previous experience should be considered in applying such guidelines.

TARE WEIGHT AND CUBE REDUCTION

EXCESSIVE PRESERVATION AND PACKING

There is a continuing need to make every effort to reduce the weight and cube of packaging materials and shipping containers to the maximum, without sacrificing protection during handling, storage, and transportation. Ecological considerations also make this reduction imperative.

- Reduction of tare weight.
  - o In consonance with Department of Defense policy of providing adequate protection at minimum cost, the military departments are constantly striving to reduce the weight of containers and materials used for preservation and packing. If items are packed in containers which are larger and heavier than necessary, these packs not only produce higher transportation costs, but also detract form storage and handling efficiency.
  - o Experience has shown that lighter container can be substituted for heavier ones in a high percentage of cases to achieve important weight, cube and cost reductions without sacrificing needed protection.
  - o It should also be kept in mind that the freight rate applied to the item also applies to the packing material. Thus, if a light, bulky, expensive, and extremely fragile item has a rating of two hundred, the weight of the packaging material is also computed at a rating of two hundred even though the container is made of heavy, dense, and inexpensive material.
  - o One military activity found that the tare weight average was running about 20 percent of the gross weight; in terms of the 70 million dollars a year that was being spent for transportation of packed products, this meant 14 million dollars for shipping the "shipping materials" consisting of containers, cushioning, and similar materials. It was estimated that every one percent reduction in tare weight average would save $700,000 in transportation charges. The smaller the percentage of tare weight to gross weight, the greater the quantity of the commodity that can be shipped for the same cost.
  - o The science of modern packaging technology has progressed greatly in both new materials and technology which coupled with globalization required the military community to be flexible and ready to evaluate/adopt new designs that are consistent with out evolving distribution changes. Additionally, we must be sure that we use commercially available packages as required by

current directives whenever they meet our logistics support requirements.

- Reduction of cube.
  - o Reduction in cube or volume of an item packed for shipment, which often occurs with a corresponding reduction in tar weight, will save valuable shipping space and storage space, as well as bring about greater ease in handling.
  - o A reduction in cube can be brought about more readily than is commonly realized. For example, a reduction of one-half inch in each dimension of a 6-inch x 6-inch unit container will result in a cube reduction of approximately 23 percent. On a larger scale, if a container 2 feet x 2 feet x 4 feet were reduced 1 inch in each dimension, a savings of 1.6 cubic feet would be effected.

EXCEPTIONS

Care must be taken not to apply tare weight and cube reduction programs to all items indiscriminately. Although excessive preservations and packing is undesirable from the stand-point of increased transportation, material, and storage costs, it must be remembered that any reductions must be made without sacrificing protection required during handling, storage, and transportation. Inadequate packaging which permits military items to be damaged or to deteriorate during shipment and storage is more than costly; it could be catastrophic if such items were required on the field of combat. There may be times when preservation and packing appear to be excessive but actually are not. Some examples are--

- Special protection for items that are prone to pilferage or are of a sensitive, classified, or hazardous nature.
- Ammunition, explosives, and other dangerous materials when packaged in accordance with approved drawings, specifications, and regulations.
- Materials and containers exceeding protective requirements where no additional costs are incurred and the specified weight and dimensions of the package design are not exceeded.

There will be other instances where excessive preservation and packing is not corrected because of cost factors. Some examples are--

- Use of available materials and containers which exceed protective requirements where otherwise unacceptable delay or excessive procurement costs would result form procurement of prescribed materials. However, this should not justify continued use of such practices.
- Ammunition, explosives, and other dangerous materials when packaged in accordance with approved drawings, specifications, and regulations.
- Materials and containers exceeding protective requirements where no additional costs are incurred and the specified weight and dimensions of the package design are not exceeded.

There will be other instances where excessive preservation and packaging is not corrected because of cost factors. Some examples are--

- Use of available materials and containers which exceed protective requirements where otherwise unacceptable delay or excessive procurement costs would result from procurement of prescribed materials. However, this should not justify continued use of such practices.

- Shipment of material previously packaged at a higher level of protection than required, but where repackaging to reduce the level would result in additional cost or unacceptable delay in shipment.
- Addition of nonreinforcing skids to heavy boxes, which increases tare weight and cube but reduces handling costs through facilitating use of forklift trucks, application of slings, and other necessary material handling devices.

PACKAGING IMPROVEMENT PROGRAM

Physical damage to freight will probable never be completely eliminated. Even if the Government made recovery for all losses or damage as a result of inadequate packaging and handling, there still would be areas in which complete reimbursement would be impossible. Some of these areas are--

- Administrative costs. Preparation of required forms to claim damage is approximately $100.00.
- Delay of schedules. Critical programs may be delayed because of delivery of required materials in unserviceable conditions.
- In order to improve packaging and to avoid repetition of deficiencies which have already caused damage, or may result in damage to material due to improper packaging, the military departments have set up a program whereby corrective action may be taken to prevent losses.

IMPROVING THE PACKAGING EFFORT

Annually, mistakes and carelessness in the packaging effort throughout the Department of Defense take a heavy toll in dollars and in other ways affect the supply system (fig 13-3). Prudent management, therefore, dictates methods to determine the cause of packaging deficiencies, to correct them, and so far as possible, to prevent their recurrence.

To this end the components of the Department of Defense have established a joint program to reduce the losses through a regulation titles, Reporting Packaging Discrepancies, Designations for the publication are DLAR 4140.55/AR 735-11/ NAVMATINST 4355.73/AFR 400-54/MCO 4430.3E. Until recently, packaging discrepancies were reported under the DD Form 6 Packaging Improvement program but these have been combined into one reporting system that also includes shipping-type (item) discrepancies and discrepancies in parcel post shipments.

Under this new program the reporting instrument is Standard Form 364, Report of Discrepancy. Generally, a packaging deficiency is any unsatisfactory condition caused by improper packaging in which the package is subject to loss, delay or damage and the estimated or actual cost to correct the condition exceeds $50. Specific examples include--

- Preservation
  - o Inadequate or omitted preservation.
  - o Inadequate or omitted container.
  - o Corrosion.
  - o Contamination.
  - o Blocking or cushioning omitted or inadequate.
  - o Excessive preservation or waste space on contractor shipments.

FIGURE 12-3. DAMAGE DUE TO IMPROPER PACKAGING (SF 364)

- Packing
  - o Container overloaded.
  - o Inadequate container.
  - o Inadequate closure of container.
  - o Broken, loose, or inadequate reinforcing bands on container.
  - o Cushioning and/or blocking inadequate or omitted.
  - o Unitizing methods inadequate or omitted.
- Marking. Identification markings incorrect, incomplete or omitted, to include National or NATO stock number, item description, quantity and unit of issue, contract or purchase number, level of protection and date, gross weight and cube, shelf life, and serial number.

Effectiveness of the program depends upon conscientious reporting of deficiencies to a series of control points and intermediate offices operated by the Department of Defense components. Details are given in the regulation.

The Standard Form 364 assists management to evaluate and improve supply operations and reporting performance.

Use in reporting substandard performance for packaging discrepancies is authorized and actually encouraged.

Discrepancies should be monitored by the individual Service or agency and any trends noted by analyzing feedback data.

SF 364s are processed via electronic media by the Defense Distribution Depots under the Distribution Standards Systems (DSS).

EFFECT OF MILSTRIP AND MILSTAMP ON PACKAGING

BACKGROUND

The current military supply system is based upon years of experience, research, and analysis of our military capabilities and needs at the present time, as will as in the future. It is designed to be a simple, flexible, responsive, efficient, and economic system limited only by our existing means of communications, transportation and data processing. As changes in these systems take place, and as changes in military concepts and capabilities take place, so will changes in the military supply system occur. This supply system is not a static system, but a dynamic one, and those who work with any part of it must realize this and be capable of making any necessary adjustments as change takes place.

There no longer seems to be a place for the supply sergeant who has one of everything stored in a supply room, even if there were only one request for it every 4 of 5 years. Instead of depending upon a big stockpile, using units are relying more upon rapid communications and expedited transportation to get their supplies; only those items which are most frequently demanded are carried, and these generally make up a very small percentage of all the items in the supply system today.

To understand the impact of today's supply system on packaging, it is necessary to be aware of three components of this system; these are the Uniform Materiel Movement and Issue Priority System (UMMIPS), the Military Standard Requisitioning and Issue Procedures (MILSTRIP), and the Military Standard Transportation and Movement Procedures (MILSTAMP).

THE UNIFORM MATERIEL MOVEMENT AND ISSUE PRIORITY SYSTEM

In 1962, the Department of Defense established this issue priority system to assure priority handling of a requisition throughout the entire logistic system, based on the requisitioner's mission and on the military essentially of the item.

The mission of each military customer is designated as one of five mission categories; the designator, indicated by a Roman numeral is called a "force/activity designator" (F/September 16, 1996). Briefly the five force/activity designators are:

F/AD	Description
I	Forces in combat and forces designated by the Joint Chiefs of Staff.
II	Forces positioned and maintained in a state of readiness for immediate combat direct combat support units.
III	Forces maintained in a state of readiness to deploy for combat and other activities essential to combat forces.
IV	Active and Selected Reserve forces which are planned for employment in support of approved joint war plans and support activities essential to such activities.
V	All other forces.

The military essentially of an item in relative to the mission of the unit is expressed by a capital letter known as the "urgency of need designator" (UND). The three urgency of need designations may be briefly described as follows:

- UND A
  - o The item(s) required is one without which the force activity concerned is *unable* to perform assigned operational missions or tasks or such condition is imminent, or,
  - o Emergency requirements for primary weapons and equipment and functional materiel required to effect emergency repairs to primary weapons and equipment to keep them operational.
- UND B.
  - o The item(s) required is one for immediate use, the lack of which is *impairing* the operational capability of the force/activity concerned. Assigned operational missions and tasks can be accomplished but with decreased effectiveness and efficiency, or
  - o Materiel is required to effect emergency replacement or repairs to auxiliary equipment systems. The force/activity can operate only temporarily as a effective unit, or
  - o Materiel is required for immediate end-use to effect replacement or repair of essential physical facilities of an industrial/production activity and without which the capability of the activity to perform assigned mission is *impaired.*
  - o Materiel is required to preclude an *anticipated* work stoppage at industrial/production activities manufacturing, modifying or maintaining mission-essential materiel.
- UND C
  - o Materiel is required for on-schedule repair/maintenance/ manufacture or replacement of all equipment.
  - o Materiel is required for replenishment of stock to meet authorized stockage objectives.
  - o Materiel is required for purposes not specifically covered by any other Urgency of Need Designator.

Through a combination of the assigned Force/Activity Designators and the appropriate Urgency of Need Designator, a Priority Designator can be ascertained by the requisitioning activity. Table 12-1 indicates the appropriate Arabic number Priority Designators derived from a combination of a given Roman numeral Force/Activity Designator with one of the three alphabetical Urgency of Need Designators. It should be noted that each force/activity can choose normally from only three Priority Designators.

Table 12-1. Derivation of Priority Designators (Relating Force/Activity Designators to Urgency of Need)

F/AD	Urgency of need designator		
	A	B	C
I	01	04	11
II	02	05	12
III	03	06	13
IV	07	09	14
V	08	10	15

Priority Designator 03 will be used by all activities for medical or disaster supplies or equipment required immediately for:

Prolonging life, relieving avoidable suffering, or expediting recovery in case of injury, illness or disease.

Avoiding or reducing the impact of epidemics or similar potential mass illnesses or diseases when in professional opinion the probability is imminent.

Priority Designator 03 will be used by all activities for emergency supplies or equipment required immediately for controlling civil disturbance, disorder or rioting. Priority Designator 06 will be used by all activities for emergency supply of individual and organizational clothing required immediately to provide a minimum of essential clothing to active duty military who are actually without the clothing required.

MILITARY STANDARD REQUISITIONING AND ISSUE PROCEDURES (MILSTRIP) AR 725-50

MILSTRIP established uniform requisitioning and issuing procedures with a priority system of supply to satisfy a military requisitioner's needs based on an issue priority designator. MILSTRIP documents prescribe codes and procedures required by the system. Requisitions are normally prepared on EAM punched cards and transmitted electrically to the supply source; by the use of automated data processing equipment, the requisition is processed and instructions prepared to ship the material.

MILSTRIP also sets maximum time limits for the processing of requisitions and issuing of material. As an aid in meeting these requirements, requisitions are classified into "issue groups" based on the issue priority designators as follows:

Issue priority designator (IPD)	Issue group
01-03	1
04-08	2
09-15	3

By using the time limits set forth by MILSTRIP, the date by which material should reach the requisitioner is established. This is the "standard delivery date" (SDD); it is expressed as a three-digit number which indicates the numeric consecutive day of the calendar year. For example, 26 September is written 269. Unless otherwise indicated by the requisitioner the priority delivery date is perpetuated on MILSTRIP documents as the required delivery date (RDD).

MILITARY STANDARD TRANSPORTATION AND MOVEMENT PROCEDURES (MILSTAMP) DOD 4500.32-R

MILSTAMP provides policies and procedures needed to manage and control the movement of materiel through the Defense Transportation System (DTS). The regulation complements both the Uniform Materiel Movement and Issue Priority System (UMMIPS) and Military Standard Requisitioning and Issue Procedures (MILSTRIP). MILSTAMP:

- Sets responsibilities for shipping, clearance, terminal and receiving activities.
- Provides advance information to optimize use of transportation resources.
- Establishes standard documentation procedures, data elements, and codes.
- Provides intransit data to evaluate transit time standards.

MILSTAMP transportation priorities to be used in the movement of MILSTRIP material by all modes of transportation will be assigned to agree with the MILSTRIP issue group as follows:

MILSTRIP I Issue group	MILSTRIP Issue priority designator	MILSTRIP Transportation priority
1	01 through 03	1
2	04 through 08	2
3	09 through 15	3

Although the mode of transportation to be used will be governed by such factory as the transportation priority, required delivery date (RDD), weight and size of shipment, nature of material, cost of transportation, distance to be shipped, and modes of transportation, servicing the consignor and consignee, the following guidelines have been established by some military activities.

- Transportation priority 1. The preferred mode is airlift.
- Transportation priority 2. The mode of transportation selected will assure delivery within the requirements of the RDD.
- Transportation priority 3. The materials will be moved via ordinary or expedited modes of transportation. Movement by airlift will be only under conditions where timely surface transportation is not available to oversea areas or when the only access to the consignee is by air transportation.

Transportation priorities 1 and 2 must be challenged with the customer prior to selecting a mode of transportation.

CHAPTER 13

Storage and Packaging

FUNCTION OF STORAGE AND ITS RELATION TO PACKAGING

Uniform storage and materials handling policies, procedures, and responsibilities for use by Department of Defense are contained in DOD Regulations 4145.19-R-1 Storage and Materials Handling. Storage may be defined as the "keeping or placing of military supplies and equipment in a warehouse, shed, or open area." Storage continues the receiving operation and precedes the shipping or issuing operation.

Storage may be thought of as the period during which materiel lies dormant awaiting a need for its use to be generated by the logistical system. During the dormant period, unknown and unsuspected deterioration and damage may occur if material is improperly preserved, packed, or handled. The packaging materials themselves may deteriorate during a storage period and thus fail to give required protection.

RELATION OF STORAGE TO PACKAGING

The service document implementing DOD packaging policy lists various factors influencing the choice of appropriate level of preservation and packing. The document states that the proper application of levels depends upon current information relative to the shipping, handling, and storage conditions to which item will be exposed. Prior experience should also be taken into consideration.

Whenever possible, commodity managers should furnish level of protection information to contracting officers when directing procurement, and to storage and distribution activities when directing distribution or reprocessing of materiel. This information should be based on destination, mode of transportation, type of storage, length of storage, and anticipated redistribution.

Although this chapter will deal primarily with packaging and storage, it must be remembered that packaging levels must usually be considered in relation to the sum total of the hazards to be encountered during shipment, handling, and storage.

Types of Covered Storage Facilities

There are various types of storage facilities that afford varying degrees of protection to materiel. The types of storage facilities are -

General-purpose warehouse. A general-purpose warehouse is constructed with roof, side walls and end walls and may be heated or unheated.

Refrigerated warehouse. A refrigerated warehouse is constructed much the same as a general-purpose warehouse, except that it is usually divided into two distinct parts. One temperature is controlled between 36°F and 46°F. The other part is freeze space in which the temperature is controlled below 32°F.

Above-ground magazine. This structure has a roof, side walls and end walls and is designed for the storage of ammunition and explosives. Above-ground magazines are built of fireproof materials and are well ventilated to lessen the danger of explosion.

Earth-covered magazine. A popular type if the igloo used to store ammunition and high explosives. It is generally constructed of masonry with an arched roof covered with earth. The arch is a safety feature. Should an explosion occur, the highest point of the arch, being the weakest part, will collapse first, thereby lessening damage.

Controlled humidity warehouse. Any type of general-purpose warehouse can be operated with controlled humidity if properly sealed and conditioned. This type facility, with humidity control equipment to keep relative humidity (RH) at 50 percent or less, provides the most efficient protection against corrosion and deterioration. Certain geographically located areas sustaining an ambient relative humidity of not over 50 percent RH within general-purpose warehouses may qualify as an equivalent controlled humidity area. Such qualification, however, must be approved by higher authority.

Dry tank. Dry tanks are constructed of metal sections and a concrete floor. They may have temperature and humidity controls and are built at ground level. Because of their size and shape, dry tanks have operating aisles for using materials handling equipment.

Transitory shelter. This facility is a prefabricated, sectional metal structure, usually with complete sides and ends but without utilities.

Shed. A shed is a roofed structure without completed sidewalls and endwalls. Sheds are used for materiel that requires ventilation or materiel that does not require complete protection from the weather.

Types of Open Storage

This type of storage provides little or no protection from the weather. There are two categories of open storage.

Open improved. This is storage space that has been graded and surfaced with concrete, tar or asphalt, crushed stone or gravel, or other suitable topping.

Open unimproved. This is a storage area that has not been surfaced with some suitable material.

Packaging and Types of Storage

Materiel must be adequately protected from environmental conditions and the elements by the means of proper storage facilities, preservation, packing or a combination of any or all of these. The type and length of storage anticipated should be one of the major factors in determining the degree of protection to be applied to material.

Open storage has the advantage of being low in cost and usually readily available. However, because supplies are given little or no protection from the elements, more protection must be designed into the pack and carefully planned techniques of preserving vehicles and other equipment must be developed. Handling of material may be costly and time-consuming.

Shed storage also costs little, is comparatively easy to construct and is well-suited for storage of supplies which need maximum ventilation and/or protection from rain, snow, or direct sunlight. Supplies must still be packed for protection from extremes of temperature, high humidity, and water vapor. Shed storage and open storage provide little protection against pilferage.

Warehouse storage offers protection from the elements, affords better working conditions, better control over the storage area, and better supervision of working personnel. In many cases, depending on the geographical location, supplies and equipment must still be packed for

protection against water vapor and possible condensation due to high humidity and extreme changes in temperature. The disadvantages include high cost of construction and upkeep, fire hazards, and scarcity of warehouses in many oversea theaters of operations.

Controlled-humidity storage takes over many functions of packaging. This storage system in itself will protect material from the adverse effects of water vapor and extremes of temperature, so only physical and mechanical protection against the hazards of handling, and stacking is required. If protection against anticipated exposures during transportation and distribution is designed into the pack, it will virtually be "as good as new" when removed from storage. Disadvantages of controlled-humidity warehouses include cost of construction and upkeep and scarcity of facilities overseas, although various types of rigid and nonrigid hutments and enclosures may quite easily be constructed or converted to controlled-humidity storage areas.

When controlled humidity storage space is not available, covered storage space and open storage space in that order of preference should be used pending availability of controlled humidity storage space. Materiel in open storage should be properly preserved and packed and provided temporary cover to the extent practicable. Temporary cover for small items may be gained through the use of containers. Representative types of equipment not requiring controlled humidity include the following:

- Trailers, such as basic ammunition, cargo and semitrailers.
- Towed nonpowered equipment, such as rocket launchers and construction equipment.
- Pipeline.
- Fortification materials.
- Hand tools, such as picks and shovels.

Prepositioned caches of weapons and equipment and floating warehouses that are stationed where they might be needed in case of war illustrate the close tie between packaging and storage, for this equipment must be combat-ready upon call. Prepositioned sets of reserve equipment stored at depots will be segregated from regular depot stocks to the extent possible. Representative types of equipment requiring controlled humidity include:

- Vehicular and nonvehicular equipment having internal combustion engines, sensitive and delicate components; electrical and electronic components; components subject to deterioration from mildew, corrosion, or rot.
- Artillery and small arms.
- Tents, canvas and leather items.
- Aircraft.
- Instruments, electric and electronic equipment.
- Special protective equipment and medical supplies and equipment.
- Chemical warfare equipment and devices.
- Miscellaneous items, such as batteries and basic issue items of a sensitive nature.

Commanders responsible for storage of prepositioned sets of reserve equipment will execute inspection, care, and preservation and packing techniques prescribed in applicable publications.

Economic Factors Involved in Storage

Economic factors that influence a storage program are the cost of administration, operating labor, physical property acquisition, and maintenance.

One important factor, which is very often neglected, is the feedback of storage experience to the cognizant services so that packaging specifications, standards, and other instructions can be revised. Such feedback information

may indicate that packaging requirements can be reduced, thus affecting money savings. Excessive deterioration may indicate a requirement for a higher degree of protection, thus extending storage life and maintaining a larger number of items in ready-to-issue condition, with less subsequent loss due to deterioration.

Another factor in the economic operation of storage facilities is a high degree of selectivity in assigning items to controlled-humidity storage. While it is recognized that most material, packed or unpacked, benefits from controlled-humidity storage, this space is limited and should be used wherever possible for the protection of valuable and critical equipment. In many cases, noncritical items are being afforded controlled-humidity storage, while critical materials are being stored in conventional space, at the same stocking point. There is a limited amount of controlled-humidity storage in the supply system. To obtain the maximum benefit from this premium storage, judicious selection of items to be protected must be practiced by storage activities.

THE CARE OF SUPPLIES IN STORAGE PROGRAM (COSIS)

PURPOSE AND FUNCTIONS

After Government acceptance from contractors, depots are responsible for maintaining supplies and equipment in a serviceable, ready-for-issue condition during the length of time the materiel is in storage. During routine warehouse operations, such as stock-picking, storing, rewarehousing, conducting inventories and location surveys, etc. storage personnel are responsible for reporting condition of supplies. However, it is also necessary to inspect the contents of packs to assure that the protection designed into the pack has been maintained and that deterioration is not occurring. The Care of Supplies in Storage Program (COSIS) (Stock Readiness) has been developed to assure required supplies and equipment are maintained in a serviceable condition through inspection and action taken to restore the supplies to ready-for-issue condition.

Because of the magnitude of the COSIS Program, the military services prepare appropriate instructions to provide for the care of materiel for which they have the prime responsibility for receipt, storage, and issue. The major functions of the program are:

- Cyclic inspection.
- Preservation and packing.
- Minor repair.
- Reporting.

PROCEDURES

Each DOD component has its own approach to the care of supplies in storage. However, the basic element in all approaches is a cyclic inspection program. This inspection may be of the following types:

- Visual inspection. Inspecting by visual means to observe the item and/or its container to detect deficiencies. This normally does not require disassembly of testing of items.
- Technical inspection. Inspecting visually and by other means which include gauging, disassembling, functional testing, and laboratory testing.
- Spot inspection. An inspection of a representative sample of the quantity of an item on hand to afford a reasonably accurate estimate of its true condition. The material must be of the same type and stored under similar conditions and manufactured or rehabilitated by the same facility.
- Full inspection. An inspection of quantities of the same type and stored under similar conditions and manufactured or rehabilitated by the same facility.

COSIS inspection stations may include facilities for cleaning and drying, preservation, packing, marking, and final acceptance inspection. Whenever possible deficiencies observed will be corrected concurrently with inspection to save handling costs and administrative action. Repacking of inspected items should be done in accordance with anticipated shipping demands whenever possible.

The length of time between cyclic preservation inspections is determined primarily by the type of storage. Although there will be variations due to individual storage conditions, workload, local climatic or seasonal peculiarities, previous storage experience, the following inspection intervals have been prescribed in the absence of more definitive instructions:

- Open storage inspection cycles of 6 months and shed storage of 12 months.
- Warehouse storage inspection cycles which will be at greater intervals than those required for open storage may vary from 24 to 30 months, the former prescribed for noncontrolled temperature warehouses and the latter for warehouses with temperature control. The level of protection may have a bearing on the inspection cycle; level A packs usually require less frequent inspections than level B packs. In a similar manner, the type of item and method of protection also affect the inspection cycle intervals.
- Controlled-humidity storage inspection cycles are 60 months.

PACKAGING LINE LAYOUT

GENERAL

The Defense Logistic Agency (DLA) has primary responsibility for Defense Distribution Depots (DDDs) which receive, store, and issue materiel. Each depot supports a packaging activity which has the following responsibilities:

- Repack stored items as required by results of periodic surveillance inspection.
- Package repaired and modified items for shipment or storage.
- Repack new receipts to protect against the hazards of storage and redistribution when original packaging is inadequate.
- Pack outgoing shipments.

SELECTION OF LOCATION

One of the first things to be considered in establishing a packaging activity is the selection of a suitable site. Packaging lines will vary from one depot to another depending upon the space available, mission of the depot, the type of material being stored. Generally, however, there are several requirements which should be met whenever possible.

The packaging activity must be central to receiving, shipping, and storage; this will reduce the amount of materials handling required. In addition, the packaging supervisors and specialists will be close by for consultation with the other segments of the depot on mutual problems.

There must be room for future expansion. A packaging line confined to a corner of a warehouse cannot grow when needed nor can it be served efficiently.

All required utilities, such as water, electricity, sewers, gas, and steam, must be provided.

Transshipment facilities, such as truck docks and railroad sidings, should be in the approximate vicinity.

A cleaning area is required which can be segregated from the other operations to prevent recontamination of cleaned parts, as well as for safety reasons.

EQUIPMENT

The equipment required by the packaging activity will be governed by the mission of the installation and by the volume of packaging required. Where there is small volume, manual operations will be feasible and economical. Mechanization of some processes, such as cleaning and drying, will reduce the number of man-hors required and will release labor for other tasks. Short packaging lines and standardized packs make planning and supplying of packaging materials in a simpler operation. Where large-volume operations are involved, cost studies should be conducted to determine what manual operations could be accomplished more economically through the use of automatic and semiautomatic equipment. In either case, the cleaning, drying, and preservative application processes can be mechanized for more efficient operation.

Wherever large-scale packaging operations can be standardized, machines which automatically make, fill, and seal bags and machines which fill and seal cartons will make the packaging process faster, more efficient, and less costly.

Flow and continuity of operations (fig. 13-1). The flow of operations within the packaging area must be carefully planned to expedite the work and reduce the amount of materials handling involved. The minimum requirements for efficient depot packaging activity should include -

- A receiving and breakdown area where material is received, routed into the various lines where it is stripped of all packaging materials and placed in baskets.
- A process planning area, which is the most critical point of the entire packaging operation. Here the process planners -
  - o Determine required cleaning, preservation, and packing operations.
  - o Record all necessary information.
  - o Notify the packaging material storage and supply area or requirements for packaging materials.
  - o Place the routing information on material.
  - o Divert material which cannot be packed manually to special areas (if the installation has mechanized packaging equipment).

A packaging material storage and supply area, where packaging materials are stored, bags and fiberboard boxes fabricated, labels and bags printed with identification marks, and from which miscellaneous supplies, such as tape, adhesives, etc., are fed into the packaging line.

The cleaning and drying area, which should be separate from the other packaging areas.

The inspection area, which is another critical point in the packaging process. The inspector will -

- Approve the cleanliness of items and route them to the preservation area.
- Reject items which have not been acceptably cleaned and return them to the cleaning area for reprocessing.
- Route cleaned items that do not require a preservative directly to the unit packaging area.
- Inspect the completed packs for conformity to packaging area.

The preservation area is where the required preservatives will be applied and excess allowed to drain. Here again the process may be mechanized if economically feasible. General cleaning and preserving are done in the maintenance shop.

The DDD preservation area is where the inclimate wrap, cushioning, unit container, and identification marking are applied to the items. In this area,

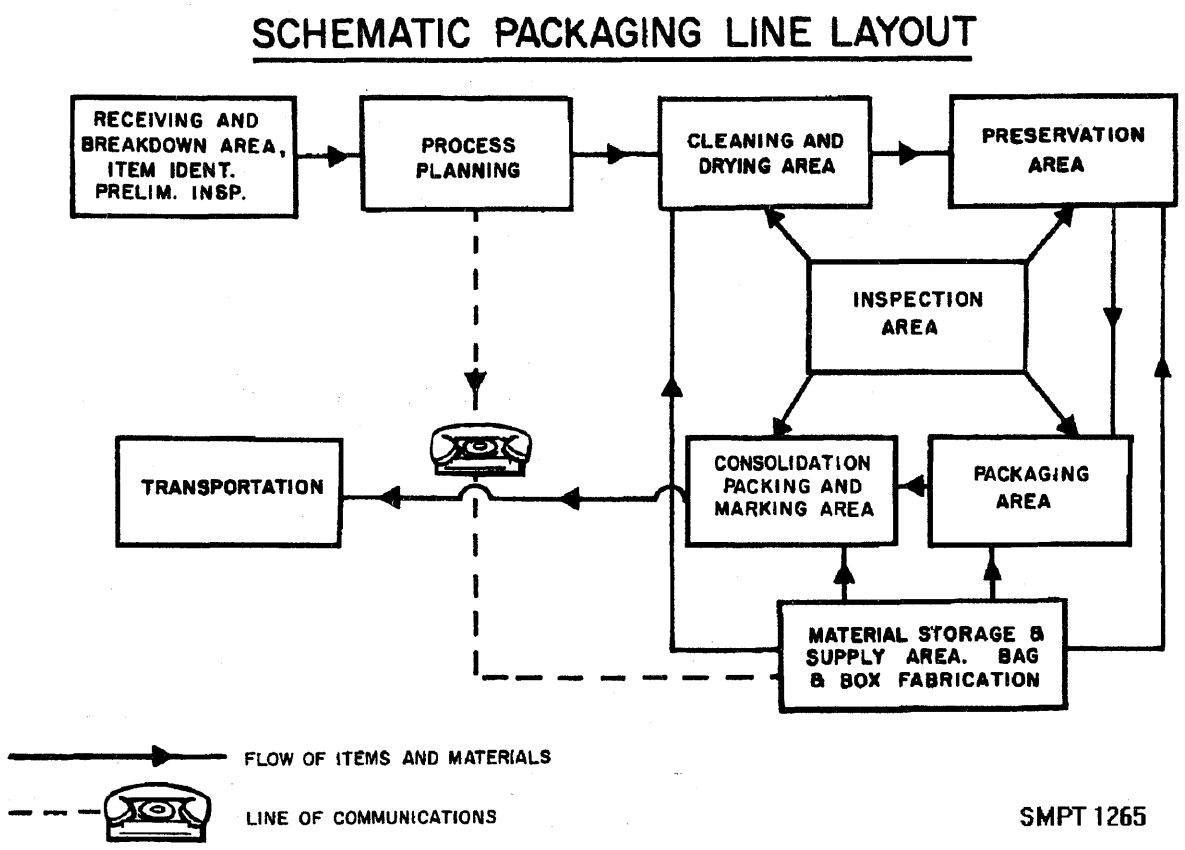


FIGURE 13-1. PACKAGING LINE LAYOUT

separate lines can be established for the different methods of preservation. Mechanized equipment may be used here. Also in this area, unit packs will be placed in intermediate containers if required.

The consolidation and packing area, where the exterior containers are brought together with the material, packed, marked, and from here conveyed to depot storage or shipping.

If there is sufficient need, a box fabrication area where boxes may be assembled from shocks, various types of fiberboard boxes fabricated, and other containers and crates assembled should be included as a section of the packaging department.

PROGRAMMING THE WORK SCHEDULE

In programming the work schedule for the packaging activity, there are certain priorities that must be honored and other factors that must be considered. In accordance with Military Standard Requisitioning and Issue Procedures (MILSTRIP) requirements, the requisitioning unit determines the priority status of needed items. The depot packaging activity must complete the required packaging within the time limit assigned to each of the priority indicators.

Workload from the COSIS program must also be part of the preservation and packing activity workload schedule. This will aid in having materiel in storage ready for shipment. Proper scheduling of the COSIS work allows

one-time processing of larger quantities rather than frequent processing of small quantities at time of shipments.

Incoming receipts requiring preservation or packing prior to storage must also be considered in the scheduling of preservation and packing work.

SUPPLYING THE PACKAGING LINE

One of the easiest ways to waste money is to have the packaging line workers standing idle because the material required for a particular job has not been delivered to the packaging line. Another cause of lost time is an uneven flow of material down the packaging line. To keep the packaging line operating efficiently, supervisors must plan and program each operation completely. This requires close supervision and complete cooperation between the various processing areas.

When the process planner makes out the work order for an item, the packaging requirements should be communicated immediately to the packaging material storage and supply area and to the box fabrication area, along with an approximate time the materials will be needed on the packaging line. The following actions should then take place.

- Wraps should be precut to size and bags cut and fabricated.
- Any required interior containers must also be fabricated and made ready for setup.
- The shipping containers must also be fabricated and made ready for use.

The prefabricated containers and packaging materials should be delivered to the proper stations along the packaging line before the items reach that stage of the processing, and in sufficient quantity so that workers will not have to be idle while awaiting stock replenishment. The flow of items through the packaging lines must also be controlled so that the operations can proceed efficiently and expeditiously. An intermittent flow of items will cause losses of labor time along the line. An overabundance of items will backup and jam any materials handling equipment, such as conveyors and monorails.

In order to keep the packaging line operating smoothly, efficiently, and economically, it is, therefore, necessary to deliver the items to the processing areas at a continuous rate no faster than the line can handle and to coordinate the supplying of packaging material with the progress of the item through the required processes.

SOURCES OF TECHNICAL INFORMATION

The process planners, in order to do their job successfully, must have the packaging requirements for many items readily, available. This library of packaging requirements must be kept current so that changes in packaging requirements can be implemented with little or no delay.

Information on packaging requirements is supplied to the process planner in many ways. Packaging requirements are furnished electronically. Some of the more common sources of this information are -

- Packaging data sheet. This document, in each of its varied forms, should give the following information:
  - o Nomenclature, national stock number and part number (if any).
  - o The preferred cleaning and drying processes and contact preservative.
  - o The required method or submethod of protection.
  - o The quantity per unit pack, intermediate pack, and shipping container.
  - o The required preservation and packing materials, identified by class, type, and grade, as applicable.
  - o The dimensions of each wrap and container.
  - o Separate packing instructions should be given for levels A and B.

- Coded packaging data. Packaging information is often given in coded form according to MIL-STD-2073-1 (Packaging Requirement Codes). The Packaging Requirement Codes are used to express the requirements for cleaning, drying, preserving, wrapping, cushioning, and the level of protection, and other packaging requirements.
- Other sources of information. If no other sources of packaging information are readily available, the process planner should refer to applicable specifications and standards covering the item or the equipment of which the item is a component.

Lacking all these sources of information, the process planner must then apply his or her knowledge of packaging to devise adequate protection for the item; he or she must consider -

- The composition of the item-whether it is ferrous, nonferrous, or nonmetallic.
- The machine finish.
- The complexity and fragility of the item.
- The degree of protection required.

SUMMARY OF PACKAGING LINE OPERATIONS

All depots, regardless of their mission, have a packaging function. The depot mission will dictate how large and complex this function must be. The packaging activity must be centrally located, supplied with all necessary utilities, and must be expandable.

Mechanized packaging should be utilized when it is economically feasible. In most cases, mechanized processes will be less costly and more efficient than manual labor.

The flow of operations within the packaging activity must be smooth and efficient if the operation is to proceed with little or no wasted labor time.

The process planner is the keystone of the depot packaging operation and must have immediate access to all required packaging instructions. Good programming and planning will result in a more efficient packaging line which, through improvements in packaging, will lead to lowered transportation and storage costs and to less materials handling.

QUALITY ASSURANCE IN THE DEPOT

As the COSIS program is to verify the quality of material during its storage life and while it is leaving the storage system, the determination of conformance to established standards will be based on objective evidence of quality.

STORAGE QUALITY-CONTROL GUIDELINES

The Department of Defense regulation titled Storage and Materials Handling (DOD Regulation 4145.19-R-1) covers general guidelines for a systems approach to a storage quality-control program. Supplementing and implementing instructions are published by various activities of the military services. The general guidelines cover the following areas:

- Development and operations application of inspection instructions. Effective inspection instructions generally contain -
- Identification of quality characteristics. Quality characteristics of supply items may include the limits of corrosion or other deterioration, physical condition of the packaging, physical (e.g., hardness, tensile strength, capacitance) and chemical properties, dimensions, weight, and functional or performance characteristics.
- Sampling procedures to be utilized. Sampling inspection may be attributes, variables, or alternate procedures, based upon local conditions and/or types of material. Applicable military standards may be used by military services to develop sampling inspection

procedures by attributes or variables. For most supplies in storage, sampling inspection by attributes will be utilized. As in any sampling plan, items must be selected without regard to their quality; that is, selection of samples shall be accomplished in a manner that will assure that each unit in the lot has an equal chance of being included. The choice of items to be drawn is to be made by inspection personnel even if the physical withdrawal is performed by other personnel.

- Description of examination and testing procedures. Detailed instructions should be provided for performing the prescribed examinations and tests, including descriptions of any required special gauging, measuring, and test equipment. The serviceability of supplies is generally measured by determination of the presence or absence of defects. Specialized definitions for storage defects are as follows:

  - o Preservation defects.
    - -- Major. Preservation which has permitted or will permit any degree of corrosion or deterioration of a critical surface or heavy corrosion or deterioration of a noncritical surface. Also, preservation which fails to provide necessary protection against physical damage which could prevent functioning at designated efficiency.
    - -- Minor. Preservation which has permitted light or moderate corrosion or deterioration of noncritical surfaces as long as use of the item is not affected. Also, preservation which does not conform to specification requirements but still provides adequate protection.
  - o Packing defects.
    - -- Major. Packing which will not give protection against physical damage during storage and shipment.
    - -- Minor. Packing which does not conform to specification requirements but still provides adequate protection against physical damage.
  - o Marking defects.
    - -- Major. A marking that lacks identification, could cause a wrong item to be shipped, could cause a misdirected shipment, a violation of statutory regulations, or could result in loss or damage to the item.
    - -- Minor. Defects which are unlikely to result in loss, damage, misdirected shipment of the item, e.g., improper or missing contract or requisition number, weight, or cube data, etc.
  - o Defects of a trivial nature. Defects of a trivial nature should not be considered as minor unless some reduction in the serviceability of the item can be expected prior to the next scheduled inspection. For example, dents and scratches that do not break the paint film are considered trivial deficiencies.
  - o Application. Defects shall be classified as major or minor if they can reasonably be expected to fall in these classes prior to the next scheduled inspection.

- Review, analysis, and interpretation of quality control data. The objectives of the review, analysis, and interpretation of the quality-control data compiled from the records of inspection results include the following:

  - o The determination of current quality and serviceability.
  - o The determination of rates of deterioration and predicted storage life.
  - o The recommended disposition of the quality evaluated item as to disposal rework, overhaul, or retention as serviceable.

- The determination, where possible, of the factors responsible for quality deficiencies, such as design inadequacies, manufacturing errors, faulty procurement inspections, and environmental conditions causing deterioration.

- Corrective action. The final action of a systematic quality control program is the corrective action taken to assure that materiel in storage is maintained in a ready-for-issue condition. Particular attention should be given to providing information to interested offices and activities on deficiencies found during quality control operations to preclude the recurrence of similar deficiencies in the future.

AUTOMATED MARKING AND MATERIALS HANDLING

LOGISTICS OBJECTIVE

The underlying thrust of all Department of Defense logistics actions is to reduce costs. Improving the productivity, timeliness, accuracy, and efficiency of logistics actions is fundamental to this objective.

Two developments that have significantly improved the cost-savings posture are automated marking and reading and automated materials handling.

AUTOMATED IDENTIFICATION TECHNOLOGY

The Automatic Identification Technology Program, where implemented, is now producing substantial savings in such Government operations as wholesale and retail receiving inventory, and location, service store issue, and depot level maintenance.

Bar coding is a way of communicating information encoded into the widths of bars and spaces. Bar code labels (fig 13-2) must be printed with extraordinary definition if proper interpretation is to take place. "Reading" is done by various kinds of scanning devices.

The AITS code is used by Defense contractors and DOD activities to mark unit packs, outer containers, and selected documents in the logistics field.

Microcircuit Technology in Logistics Applications (MITLA) is another automatic identification technology that has also been included within the AITS Program. This technology will be utilized in applications such as electronic bill of lading, configuration management, automated logbook, and container/vehicle control. MITLA provides the user with a means of storing fixed as well as variable data that can be updated as required for changing materiel conditions in the logistics system, e.g., 2D, laser, magnetic and smart cards.

COST SAVINGS

Before AIT was adopted it was tested in various roles for its cost savings potential. Not surprising, it was huge. Tangible savings in the DOD annually were said to approach $114 million. Of this, more than $100 million was saved in transactions involving depot level maintenance, ammunition inventory, and service store inventory and issue. Additional savings are projected as new applications arise.

AIT produces intangible benefits as well. Data entry accuracy, productivity, and customer satisfaction is increased by the elimination of human error. As bar coding spreads throughout the DOD, increased benefits are expected from the integration of multiple functions, decreasing equipment costs, and reduced labeling costs. Automation of documentation and increased capability to electronically transmit data means less burdensome paperwork. Use of various radio frequency; transmitters/readers and hand-held reading devices.

STANDARD DOD SYMBOLOGY

THE 3-OF-9 BAR CODE, WITH HRI (FULL ALPHANUMERIC) PRINTED IN-THE-CLEAR

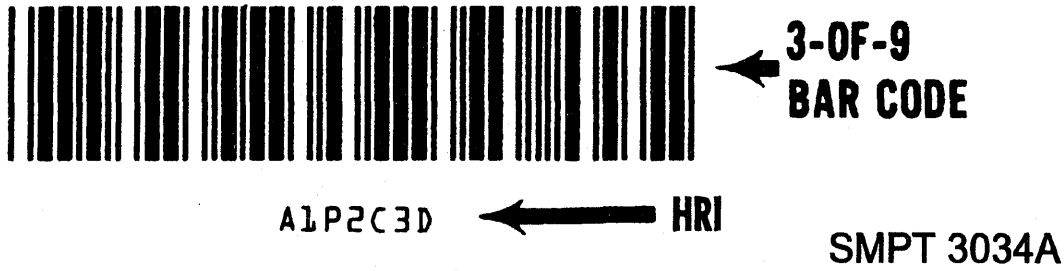


FIGURE 13-2. Standard DOD Symbology Consisting Of Bar Code and Human Readable Interpretation (Hri)

IMPLEMENTING DOCUMENTS

Three documents have been introduced to standardize symbols and procedures.

Department of Defense Instruction 4100.XX titled, Standard DOD Symbology for Logistics Applications, establishes policies and delineates responsibilities for use of the bar code within DOD. It mandates that the symbology will be incorporated into all logistics applications where it is technically and operationally feasible so long as it is cost-effective.

A military standard, MIL-STD-1189 titled, Standard Department of Defense Bar Code Symbology, specifies the technical parameters required for contractors or DOD activities to print a scannable bar code.

Military Marking MIL-HDBK-129, Department of Defense Handbook, contains guidance on data elements to be symbol marked and on orientation and placement of the bar-coded symbol on unit packs and outer containers.

MATERIALS HANDLING

One approach to reducing storage and materials handling costs is the development of automated warehouses. Approximately 70 to 85 percent of military supply items are small enough to be kept in bin storage. This has prompted numerous studies on the possibility of mechanizing receiving and issuing actions. With modifications and additions, conventional warehouse conveyor equipment is converted to an automated materials handling system.

In a nutshell, automated materials handling involves centrally operated, electronically controlled, electrically powered conveyors to move supplies received into or issued out of a storage warehouse.

There are many advantages to an automated materials handling system. Material is moved faster and easier. Such systems provide for scheduling work, resulting in a continuous, steady flow of material throughout the depot or center which permits more efficient use of manpower and equipment. The possibility of errors occurring is lessened because issue documents are carried along with the material. Requirements for such material handling equipment as fork trucks, tractors, trailers and pallet jacks are reduced. The system has the capacity for absorbing a rising workload and meeting emergencies with a minimum increase in manpower and facilities.

Relation of Automated Materials Handling to the Packaging Activity

Because an automated materials handling system normally requires a carefully programmed schedule, the flow of materials to and from the various depot activities must be carefully regulated and coordinated. This preplanning should enable the packaging supervisor to make a more accurate determination of personnel requirements and required cleaning, preserving and packing materials and operations.

When packaging equipment is mechanized, such equipment is arranged to mesh with the depot automated materials handling system. When this is done, less time is needed to move material from the packaging area to either the storage bins or the shipping area.

Most automated materials handling systems at the present time are designed for items to be placed in bins (fig 13-3). As future improvements occur there will be a decrease in the weight and cube limitations of items of supply to be handled and a decrease in the number of items that must be manually handled. Systems capable of handling loaded pallets in fast and efficient ways are now in use at depots, Air Force bases and other locations (fig 13-4).

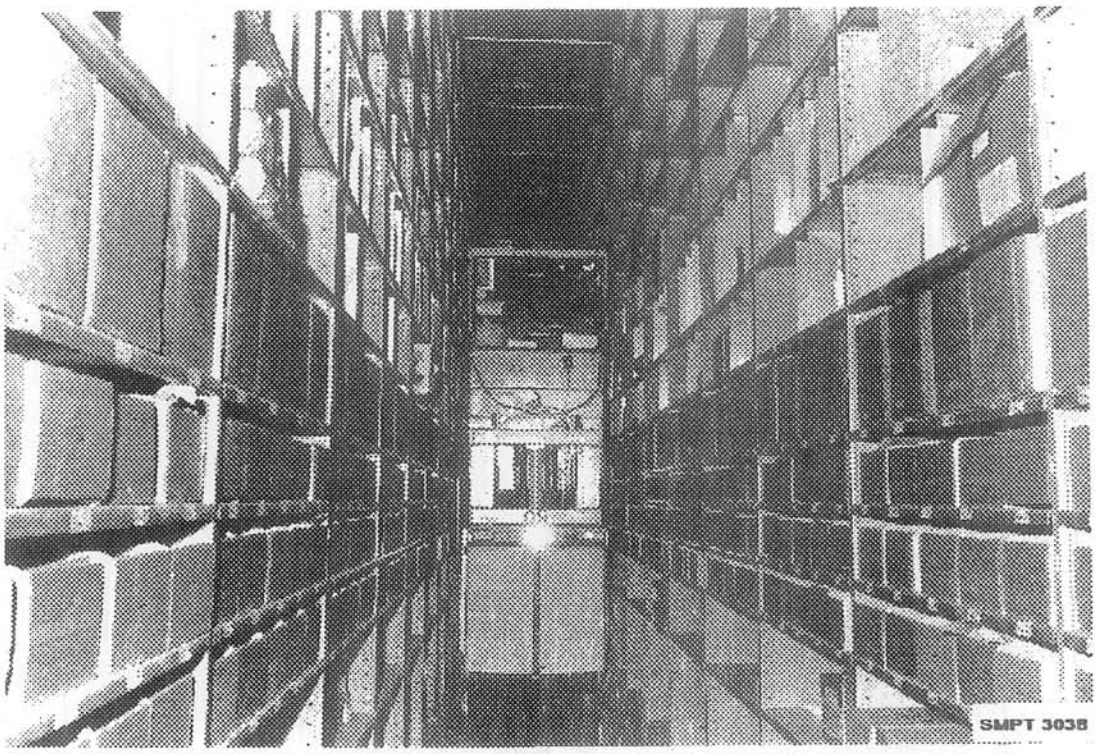


Figure 13-3

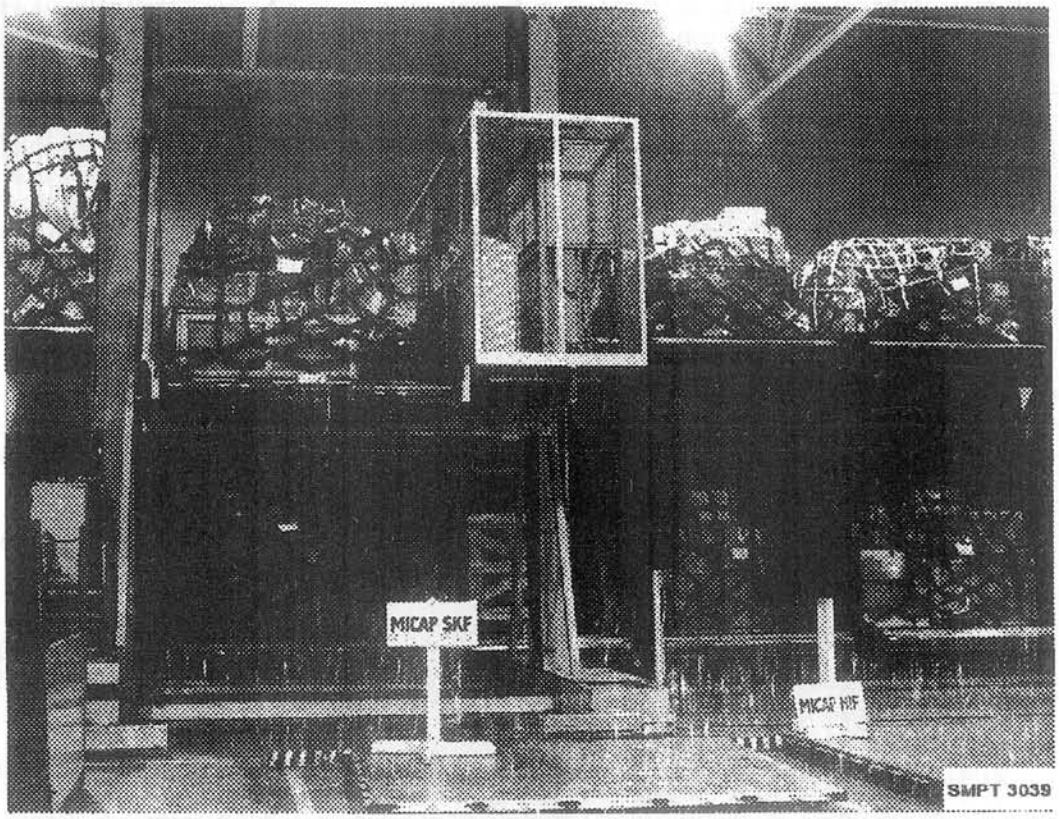


Figure 13-4

CHAPTER 14

Packaging Standardization

DEPARTMENT OF DEFENSE STANDARDIZATION BACKGROUND

Throughout history, standardization has played an important part in man's achievements. Man has constantly engaged in standardization to some degree or other. To primitive man, standardization was the devising of methods to feed, clothe, and protect himself. Later, man adopted a standard of measure for surveying land. Gold coins were introduced as a standard of value, and standard forms of speech and writing were introduced to increase man's knowledge and understanding.

Man soon discovered that standardization also provided military leaders with the most effective means for improving their fighting forces. The first known military items standardized for the US Army were the muskets to which Andrew Jackson credits his victory at the battle of New Orleans. These muskets, produced in 1801 by Eli Whitney, were made to standards which called for high levels of workmanship, accuracy, inter-changeability of parts, and utilization of standard ammunition. Today, standardization is one of the largest factors in the improved operational readiness of out overall fighting forces.

DEPARTMENT OF DEFENSE STANDARDIZATION AND SPECIFICATION PROGRAM

Scope

The Defense Standardization Program as established by DOD Standardization Manual 4120,1-M is concerned with --

- Standardization of material, components, equipment, and processes with respect to items and services approved for use by the Army, Navy, Marine Corps, and the Defense Logistics Agency.
- Standardization of engineering practices and procedures essential to design, procurement, production, inspection application, preservation, and preparation for delivery of military supply.

Purpose

To improve the efficiency and effectiveness of logistical sup-port and operational readiness of the Army, Navy, Air Force, Marine Corps and the Defense Logistics Agency.

To conserve money, manpower, time, production facilities, and natural resources.

Objectives

Sections 2451-2456, Title 10, United States Code (The Defense Cataloging and Standardization Act), makes mandatory the achievement of the highest practicable degree of standardization throughout the Department of Defense. The objectives of the DSP are to:

- Improve the operational readiness of the Military Department and the Defense Agencies.
- Conserve money, manpower, time, facilities, and natural resources.
- Improve the quality, reliability, maintainability, and safety of systems and items of supply.

- Improve the logistics support of weapon systems supplies by reducing the variety of items, processes, and practices.
- Enhance the interchangeability and interoperability of equipment and supplies between the Military Departments and the Defense Agencies.
- Enhance the interoperability of U.S. and allied military equipment and supplies.
- Establish uniform requirements for the design, construction, and maintenance of military installations, facilities, and civil works.
- Plan and accelerate the insertion of new technology into systems and equipment.
- Sustain and improve the industrial and technology base.
- Promote competition.
- Improve communication and reduce misunderstandings between the Department of Defense and industry and between customers and suppliers.

ADMINISTRATION OF THE STANDARDIZATION PROGRAM

The Assistant Secretary of Defense for Economic Security is responsible for the Defense Standardization Program (DSP) policy guidance and administration. Acting as liaison between OASD and the services is the Standardization Program Division. Management of department participation in the DSP is accomplished by the Service Departmental Standardization Offices (DepSOs). These offices also act as contact points for developing reports and for policy implementation.

Actual standardization of items, materials, procedures, and processes is accomplished by standardization activities. Lead Standardization Activities (LSA) and Standardization Management Activities (SMA) are those offices which manage Federal Supply Classes (FSC) or standardization areas. Areas are groups of documents which cover more than one FSC or relate to practices, procedures, and terminology.

There are more than 600 FSC numerical classes and 36 standardization areas. All standardization assignments made within the Department of Defense fall into one of the classes or areas. Determination of assignment within these classes or areas is based on activity interest and the end use of the item, procedure, study, or process. Most LSAs manage numerous FSCs or areas.

The LSAs job, in brief, is to assign standardization projects to preparing activities and approve or disapprove the project. Such projects include preparation of specifications, standards revisions, amendments, technical analyses, engineering practice studies, and serving as the adopting activity for non -Government standards. The preparing activity will develop the document, date and number it, and arrange for publication through the Defense Printing Services Detachment Office in Philadelphia, PA. The LSA has responsibility to determine that the project scope was accomplished through review of a "printer's proof" of the document.

One of the DOD standardization areas is the PACK area. This area is important since it includes documents which establish packaging requirements for much military supplies. This area is somewhat unique, because it involves, to a high degree, all military departments, the Defense Logistics Agency, and the General Services Administration. In addition, the PACK Area manager must understand the needs and problems associated with packaging throughout the military logistics supply system.

INDUSTRY'S ROLE IN DEFENSE STANDARDIZATION

The DSP continues to recognize the value of non-Government standardization documents procure by nationally-known standards writing associations, organizations, and technical societies. This follows from a major mission of the DSP, namely to develop, establish, and maintain a comprehensive and integrated system of technical documentation, one purpose of which is to save money, manpower, time, production facilities, and natural resources. Technical documentation comprises specifications, standards, handbooks, engineering drawings, and related documents.

Thus it happens that a large number of industry associations have been identified by the DOD to assist in the Government's standardization program, Several of these widely known associations include the (ASTM) American Society of Mechanical Engineers, and the Institute of Electrical and Electronics Engineers.

Another major vehicle for Government-industry standardization are Commercial Item Descriptions (CID). These are brief, performance oriented product descriptions used in the acquisition and distribution of commercial and commercial-type products.

REQUESTING STANDARDIZATION PROJECTS

Any activity can request that a project be initiated by contacting the lead service activity for a specific class or area. Adequate justification for a project should be included with the request. If in doubt the contact point for a particular project, reference should be made to the Department of Defense Standardization Directory SD-1 (FSC class and Area Assignments). This publication lists the assignee activity for a particular FSC or area assignment and the mailing address of the appropriate point of contact.

STANDARDIZATION IN PACKAGING

PACKAGING AND THE ACQUISITION DOLLAR

The present Department of Defense stock catalog consists of over four million items; these items must be packaged and/or identified prior to storage or shipment. In order to accomplish necessary packaging for these items, there exists a multitude of procurement and packaging documents, some of which are in conflict with each other. It is possible to find manufacturers using different sets of instruction while packaging and marking the same item for delivery to the respective military services. This is one of the prime reasons why packaging standardization is necessary.

Packaging costs take up a considerable amount of the procurement dollar. In some instances, the cost of packaging the item is more than the cost of the item itself. Reduction in this area would permit purchase of more items per dollar expended.

OBJECTIVES OF PACKAGING STANDARDIZATION

Like Packaging for Like Items

The majority of items in the military supply system have characteristics which are similar to hundreds or even thousands of other items. Work is going on toward the development of documentation of criteria which will assure uniform packages for items which met a pre-established set of characteristics.

Reduction of Materials and Methods

This objective goes hand in hand with the first objective. At the present time there are many preservation and packing materials classified in

various types, grades, classes, styles, etc. Because of this great variety of materials, the problem of material availability is common at vendor's plant and military packaging activities. Nonavailability of prescribed materials results in requests for waivers or substitutions which, when granted, often result in underpackaging or overpackaging at more cost to the Government.

Whenever possible, methods should be reduced to the maximum extent practicable by making effective use of methods capable of mechanical application while still attaining adequate economical, and uniform protection.

The reduction of materials and methods through standardization would bring about --

- Reduced inventories.
- Reduced procurement costs.
- Improved workmanship.
- Increased production.
- Simplified documentation.

Reduction of Number of Packaging Documents

This objective can be realized by the elimination of needless or redundant documents. At the present time there are many instances where two documents exist for the procurement of the same item. The difference between a Federal and military specification is frequently only a slight difference in the requirements; a change to either document results in the cancellation of the other. This is an area where users of documents in packaging operations are often best qualified to make known such duplications.

PACK STANDARDIZATION AREA

The LSA for the PACK area is the U.S. Army Materiel Command Logistics Support Activity Packaging, Storage, and Containerization Center (LOGSA PSCC) located at Tobyhanna, PA.

The "PACK" standardization program activities. Developing and maintaining the currency of military specifications and standards relating to packaging requirements, procedures and practices are important parts of the program.

The assigned LSA (LOGSA PSCC) has the central program management responsibility for identifying, providing application guidance, promoting, planning, scheduling, coordinating, controlling and maintaining standardization documents falling within the purview of the Defense Standardization Program, which relate to the following:

- Packaging -- Preservation Methods.
- Packaging Requirements Codes.
- Procedures for Packaging.
- Materials used in Packaging.
- Packaging -- Data Requirements.
- Identification Marking for Storage, Handling and Shipment.
- Item Preparation for Delivery.
- Transportability Requirements.
- Packaging Design for Systems and Equipment.
- Packaging Cargo Interface Considerations.
- Reusable Packaging Methods.

- Terms and Definitions for Packaging, Handling, and Transportability.

INITIATION OF PACK STANDARDIZATION PROJECTS

Standardization projects stem from requests by DOD components, and the General Services Administration Projects may also be generated by the LOGSA PSCC, based on determinations that a change will meet a PACK objective; these determinations are arrived at through PACK document research, review of standardization listings, changes in field requirements may also be generated by a preparing activity which has the task of maintaining a particular document.

In general, activities engaged in preservation and packing are in a better position to recognize a need for new or revised documents than are those at the headquarters of staff level. Accordingly, the bulk of such requests for revisions to specifications or standards should come from the user. For example, and activity that recognizes a packaging need or a need for a change to a document in the PACK area would contact its respective departments custodian. The request would be evaluated and, if valid, contact would be make with the preparing activity; if acceptable to the latter, a project for an amendment or revision would be initiated by the PACK are LSA. Based on priority and amount of work involved, project completion would probably range from one to six quarters.

MANAGERS AND PACKAGING STANDARDIZATION

Operating Level

The people who prescribe packaging are different for those who actually accomplish the packaging. Personnel involved at the operating level can render a real service by making known those conditions which are in need of improvement and change.

Packaging Management Level

Those who supervise the preparation of packaging prescriptions should be aware of conditions and problems which can be caused by improper prescriptions should be aware of conditions and problems which can be caused by improper prescriptions. Wherever possible, methods and procedures that lend themselves to mechanical applications should be cited. Only those material which are readily available should generally be prescribed.

Other Management Levels.

Managers is areas of procurement, supply, and transportation also are in a position to assist in packaging standardization efforts and to advise on potential projects.

Procurement Managers

A part to be played by managers in this area is to determine if their employees have received adequate training which will enable them to single out defects in procurement documents. An example would be in comparing contracts for like items at different times and reporting obvious examples of underpackaging or overpackaging.

Supply Managers

These individual should also influence their people to report packaging discrepancies. An employee in the field of supply, if adequately trained to recognize improper packaging trends, would be a great asset to the standardization program.

Transportation Managers

Since one of the ever-present problems centers on weight and cube of shipments, transportation people are in a position to assist packaging and storage personnel by keeping then advised when there appears to be unusual cube and weight increases. By creating an awareness of the value of standard container size wherever possible, other actions will occur which will be of mutual benefit for all concerned.

STANDARDIZATION OF PACKAGING DOCUMENTATION IN CONTRACTS

There are nearly as many different forms, formats, instructions, and clauses for prescribing packaging in contracts as there are procuring activities. There is a project now underway to effect standardization of these forms, formats, clauses and other documents. This will benefit all DOD activities.

CHAPTER 15

Application of Automatic Data Processing Systems (ADP) to Packaging

ADVANTAGES OF AUTOMATIC DATA PROCESSING

In an organization as large as the Department of Defense, one of the basic problems is communication. This is as important a problem in the field of packaging as it is in any other logistic operation. The ability of electronic computers to store information, to process it as programmed, and to publish the results of its operations at incredibly high speeds has done much to minimize this problem of communications in expressing, maintaining, and revising military packaging requirements.

Through the use of electronic computers, the military has been able to achieve a much greater speed of response to changes in packaging requirements than was possible before the adoption of automatic data processing systems (ADP) by the services.

THE APPLICATION OF ADPS TO PACKAGING

The electronic computer, with its ability to store data, make speedy correlations, and furnish information on order, is an ideal tool to maintain and control the tremendous inventory necessary to support the services. Electronic computers were first used by the logistic elements of the services for just this purpose - inventory control and stock management.

At the time when electronic computers were being introduced into the supply system, it was becoming apparent that the paperwork involved with military packaging was becoming a burdensome factor which hindered effectiveness and accuracy. Because of the computer's ability to store great quantities of data, the use of ADP seemed a logical way to reduce and minimize the mountains of paperwork generated by applying narrative requirement to repetitive acquisition documents.

Several methods of applying the automatic data processing tool to the storing of packaging requirements and the furnishing of these requirement on request were developed by various activities within the services, each tailored to express needs of the activity and influenced by the particular electronic computer in use and by how the activity was using its computer. Some consisted of abbreviations; some made reference to standard instructions; still others were coded systems which established references for citing the difference elements of packaging requirements.

CODING SYSTEMS

Coding systems came rapidly to the forefront, with one or more coding systems being advocated by, and used, in each of the services. Each of the systems had merit and served the purpose of the agency implementing it, but a multitude of similar, but not identical, systems does not facilitate implementation or acceptance by industry. They even retard the ability of services to exchange date among themselves.

Spurred by complaints from industry, a joint task group devised a code to be used to express packaging requirements. This code included the best elements of several previous systems, and met all the requirement of

automatically storing, manipulating, applying, and comparing packaging requirements. This code was published as MIL-STD-726 and was mandatory for use by all agencies using coded packaging data in procurement.

CURRENT SYSTEMS

DOD PACKAGING DATA SYSTEM

While the publication of MIL-STD-726 served to standardized coded packaging data, the wide variety of forms and formats used within the DOD to communicate non-coded packaging data continued to retard the exchange of data and increase packaging costs within DOD and to DOD from industry. Based on OASD direction to standardize packaging requirements and documentation, the DOD Packaging Data System was developed and published in July 1984 as MIL-STD-2073-1 and MIL-STD-2073-2.

The DOD Packaging Data System is now based on one document - MIL-STD-2073-1C. This document outlines standard processes for the development and documentation of military packaging, as distinct from commercial packaging. This standard covers methods of preservation to protect materiel against environmentally induced corrosion and deterioration, physical and mechanical damage, and other forms of degradation during storage, multiple handling, and shipment associated with the military distribution system.

The DOD Packaging Data System requires that all materiel to be packaged be categorized by chemical composition, weight, size, fragility, and preservative requirements and based on categorization, classified into one of three types of items; namely, common, selective, or special.

Common items qualify for prescription of predetermined packaging codes contained in MIL-STD-2073-1. The use of pre-determined packaging eliminates duplication. Items with a fragility rating of 85 G's or more which have no dimension greater than 24 inches and not more than 10 pounds mass (weight) for which predetermined packaging has been developed.

Selective Items Group

Items that cannot appropriately utilize predetermined packaging developed by common group technique yet do not require a drawing, sketch, illustration or separate narrative type instruction to specify packaging details.

Special Group Items

Items with peculiar characteristics such as weight configuration, complexity, fragility, or other considerations that cannot be classified as common or selective. An item is considered special if drawings, sketches, illustrations, or separate narrative type instructions are required to specify packaging details.

CONTAINER DESIGN RETRIEVAL SYSTEM (CDRS)

Container design proliferation has been a matter of concern for a number of years. Engineering costs for these designs range from a few hundred dollars to over a hundred thousand dollars each.

If we consider all designs that are presently in the total military system, we recognize a very considerable investment with limited follow-on value. Normally containers are without specific identify apart from the commodity being protected; consequently, reuse of a particular design for new

requirement is limited to those projects where the engineer has knowledge of the previous effort.

Container Design Retrieval System (CDRS)

A management system program to provide a DOD centralized automated data base system for storing, retrieving and analyzing existing container designs and test information concerning specialized containers. The purpose of the CDRS is to avoid duplication in container designs, minimize the number of new container designs being developed and promote reuse of existing DOD specialized containers for new item development and procurement.

The Container Retrieval System Management Office (CDRS/MO), Eglin Air Force Base, FL manages the container design retrieval system. Regulating document is AFR 71-12/AR 700-16/ NAVMATINST 4030.10/DLAR 4145.35. Detailed implementation requirements for the CDRS are specified in MIL-STD-2073-1C or latest version.

Objectives of the system are to provide:

- A uniform means of identifying, recording, and retaining technical and item management information on specialized containers.
- In-depth review of technical container data on existing container assets to determine their reusability in new defense systems acquisitions.
- Prevent reusable specialized containers from being disposed of as excess property before determining their possible use in new defense systems programs.
- Standardize containers among similar items and among the various DOD components.

Hazardous Materials Information System (HMIS)

This system is a repository for collecting, maintaining and broadcasting hazardous materials data required at all levels of DOD management so as to develop procedures to in from Federal government personnel of various kinds of hazardous materials. Included are such materials as flammable liquids and flammable solids, corrosives, oxidizers and radioactive materials usually encountered in the work place. The procedures developed help avoid accidents in the handling, storage, use, transportation and disposal of these items.

Presently, the system contains transportation, health and safety data. Hazardous waste disposal information is planned for early inclusion.

Transportation data consists of the shipping name of the hazardous material, the hazard classification, and label requirements. Once out of the computer, this information leads to hazardous materials tables published in various transportation regulations such as Title 49 of the Code of Federal Regulations which in turn yield information about proper methods of packaging.

Safety and health data include health hazard data, spill and leak procedures data, and special protection and precaution data.

The output of the HMIS is principally microfiche, but magnetic tapes and hard copy interrogating replies are also available. Data is arranged in stock number sequence.

Detailed explanation of data elements in the system are contained in DOD Manual 6050.5-M, DOD Hazardous Materials Information System Procedures.

Authority for the HMIS rests with DOD Instruction 6050.5. The system is administered by the Defense Logistics Agency.

CHAPTER 16

General Services Administration Support to Military Packaging

ORGANIZATION AND FUNCTIONS

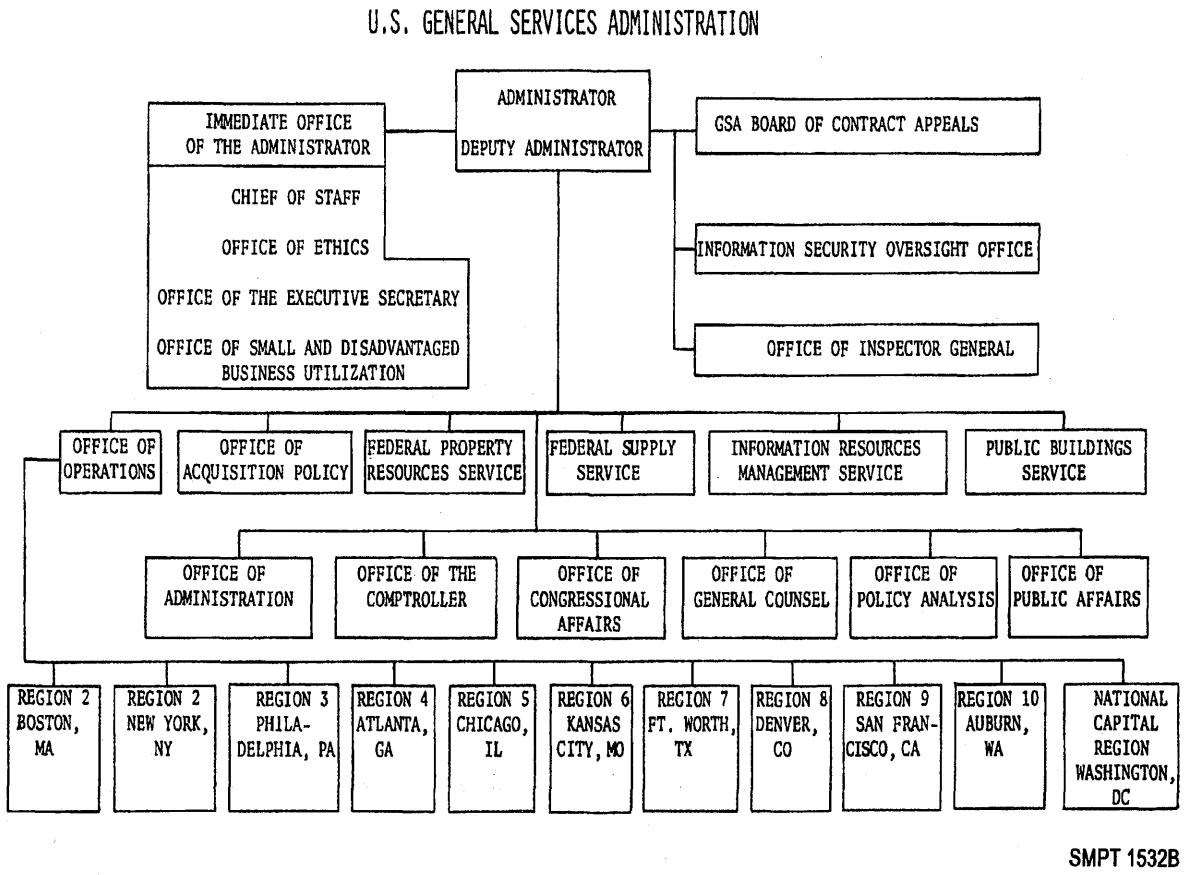
A brief explanation of the history, basis in law, missions, and general structure of the General Services Administration (GSA) will provide a background for understanding how the Federal Supply Service fits into the picture.

In 1948, the President sent a message to Congress which urged that a better system of property management be established for the Federal Government to coordinate activities concerned with the acquisition, use, and disposal of Government property. Shortly thereafter, the report of the first Hoover Commission, entitles "Office of General Services", contained a strong recommendation for the establishment of centralized direction of the supply, records management, and public buildings operation and maintenance functions of the Federal Government. As a result, Public Law 152, the Federal Property and Administrative Services Act, was enacted in 1949, which established the General Services Administration (GSA) and transferred to it from discontinued predecessor agencies the responsibility for the direction and coordination of the internal Government business management functions enumerated above. Several later presidential reorganization plans and supplemental provisions to the basic law assigned collateral functions.

The Administrator of General Services, subject to the direction and control of the President, accordingly directs the execution of all functions assigned to the Administration by the aforementioned Federal Property and Administrative Services Act of 1949, as amended by other laws and Presidential reorganization plans.

The principal missions of GSA and the primary purpose of its establishment are reflected in the declaration of policy contained in the Act, and pertain primarily to coordination of the Government's supply and public buildings operation. After a period of expansion that paralleled the growth of Government for over the past 3 decades, GSA is no focusing on performing functions that will clearly benefit from economics of scale or from centralized management and is decentralizing the responsibility for per-forming other functions to Federal agencies.

GSA is grouped organizationally to promote the most effective accomplishment of its primary responsibilities, and its current organizational structure has evolved as experience dictated and as additional functions were acquired (Figure 16-1). It consists of four services and ten staff offices. The services are the Federal Supply Service, Public Buildings Service, Federal Property Resources Service, and Information Resources Management Service. The staff offices are the Office of Administration, Office of Acquisition Policy, Office of General counsel, Board of Contract Appeals, Office of the Comptroller, Office of Congressional Affairs, Office of Policy Analysis, Office of Public Affairs, Information Security Oversight Office, and the Office of Operations. Their responsibilities are generally as their titles imply.



SMPT 1532B

FIGURE 16-1. GSA ORGANIZATION

ROLE AND MISSION OF THE FEDERAL SUPPLY SERVICE

SERVICES

Besides meeting the needs of its customers for common-use goods, FSS provides a number of services designed to assist agencies in minimizing their costs. The service programs rely extensively on the private sector under contractual or similarly negotiated agreements to satisfy the majority of these requirements.

PROPERTY MANAGEMENT

The property management program is responsible for the transfer of excess personal property from one agency to another, donations of surplus property to authorized recipients, such as state and local governments, and the sale of surplus property to the public with its value recovered by the government.

TRAVEL MANAGEMENT

The travel management program offers the services of commercial travel agents to arrange itineraries and secure tickets and reservations for Federal travelers. It also manages Hotel/ Motel Discounts and Discount Air Fare/Train/Car Rental Programs.

TRANSPORT MANAGEMENT

The transportation program negotiates reduced rate arrangements with carriers to move household goods for employee relocation, reduced rate and routing services for transporting freight, and economical express, overnight express small-package delivery services.

FLEET MANAGEMENT

GSA Interagency Fleet Management System provides over 144,000 vehicles and related services to Federal agencies through a network of 69 Fleet Management Centers located throughout the United States.

A BRIEF HISTORY OF FSS

The beginning of the Federal Supply Service can be traced back to Alexander Hamilton, our nation's first Secretary of the Treasury. During the Revolutionary War the purchase and distribution of supplies became a serious problem for the American Army. As early as 1789, Alexander Hamilton recognized the need to bring purchasing and supply under Federal Government control. At Hamilton's request, Congress passed a law in 1792 placing overall procurement policy under the Treasury Department. Hamilton began personally approving every item needed by Federal employees. He soon realized the enormity of this task; and in 1794, the position of Purveyor of Public Supplies was created.

In the decades that followed, procurement responsibility shifted back and forth between civilian agencies and the military depending on the climate of the times. During the war of 1812, the Army and Navy took overall responsibility. In 1861, Congress passed a law requiring that purchase of materials be subject to competitive bidding. Then, in 1893, Congress created the Board of Awards to oversee all Federal contracting which later became the General Supply Committee.

To complicate matters more, the War Industries Board was created in 1917 to oversee purchasing in support of the war effort for WWI. Wars dictated buying power; yet, even after WWII, the civilian side of the house was still receiving little supply priority.

This did not change until 1948 when President Truman told Congress a better administrative system was needed for the Federal Government. Shortly thereafter, the first "Hoover Commission" issued a report strongly recommending consolidation of Federal Government supply, records management, and public building operations. As a result of the Hoover Commission recommendations, the General Services Administration was established by the Federal Property and Administrative Services Act of 1949.

The modern day Federal Supply Service took form during the Vietnam conflict. The Department of Defense did not turn over responsibility of non-military supply items until 1962. FSS quickly grew to meet its part of the logistics demand required to support the 3 million members of the armed forces in Vietnam and the 150 billion dollar expense of the next 10 years. Today, FSS along with the Department of Defense and the Department of Veterans Affairs make up the National Supply System serving the overall supply needs of the Federal Government.

THE FSS MISSION

To create an environment, through policy, guidance, and service delivery, in which the personal property and administrative service requirements of our customers are effectively met at the least overall cost to the taxpayer.

Today, we provide our customers approximately $8 billion in supplies and services through our operating programs. Through these programs and through the policies and guidelines which we develop and issue, we will continue to invest our expertise and market leverage to assure that our customers have access to:

- Supplies, equipment, and services which offer choice, quality, competitive prices and prompt delivery.
- Vehicle support that is cost competitive, convenient and reliable.
- Travel and transportation services, including aircraft management, which support effectiveness when on business-related travel or when wishing to ensure the safe, reliable and cost-advantageous movement of material, and
- Property management services which demonstrate a keen concern for the management of Federal assets by assuring that unnecessary procurement of new material is averted, that excess property is promptly reassigned to relieve space resources and finally, that surplus personal property is disposed of with maximum benefit to the taxpayer.

FEDERAL SUPPLY SERVICE (FSS) - AN OVERVIEW

FSS is an organization of approximately 4,221 employees that provide products and services to over 165,000 civilian and military activities worldwide. The overall purpose of FSS is to reduce the cost of government operations It does so by providing common use essential products and services, in a timely manner, at lowest cost to the taxpayer. The types of products available through FSS range from office supplies and cleaning products to high technology scientific and electronic equipment. This list goes on from paint to furniture to hand tools, passenger cars, light trucks, ambulances and fire trucks. Services by FSS include employee travel and relocation; transportation of freight; motor vehicle support; utilization and disposal of personal property; and cash management services including debt collection. All are designed to assist Federal agencies in minimizing their operating costs and subsequently the cost to the taxpayer.

PRODUCTS

To meet our customers' diverse needs for common use products, FSS administers three basic programs: Stock, Special Order, and Schedules.

STOCK PROGRAM

Our nationwide warehousing and distribution system supplies a wide array of items form paper clips to tools. Wholesale stock items are listed in the GSA Catalog which provides descriptions, units of issue, prices and pictures. The most frequently used office and administrative supplies are made available through our Customer Supply Centers (CSCs).

SPECIAL ORDER PROGRAM

FSS places orders with commercial suppliers on behalf of our clients. Delivery is made directly by the vendor to our client. Commodities whose storage costs are significant or whose shelf life is short, such as furniture, automobiles and paints, are obtained using this method of supply.

FEDERAL SUPPLY SCHEDULES PROGRAM

FSS establishes contracts and distributes schedules to our clients who place orders directly with schedule vendors. Vendors, in turn, ship to and bill the ordering activity. Procurement/Commodity Management responsibilities for items in the GSA Stock, Special Order and Supply Schedules Programs are

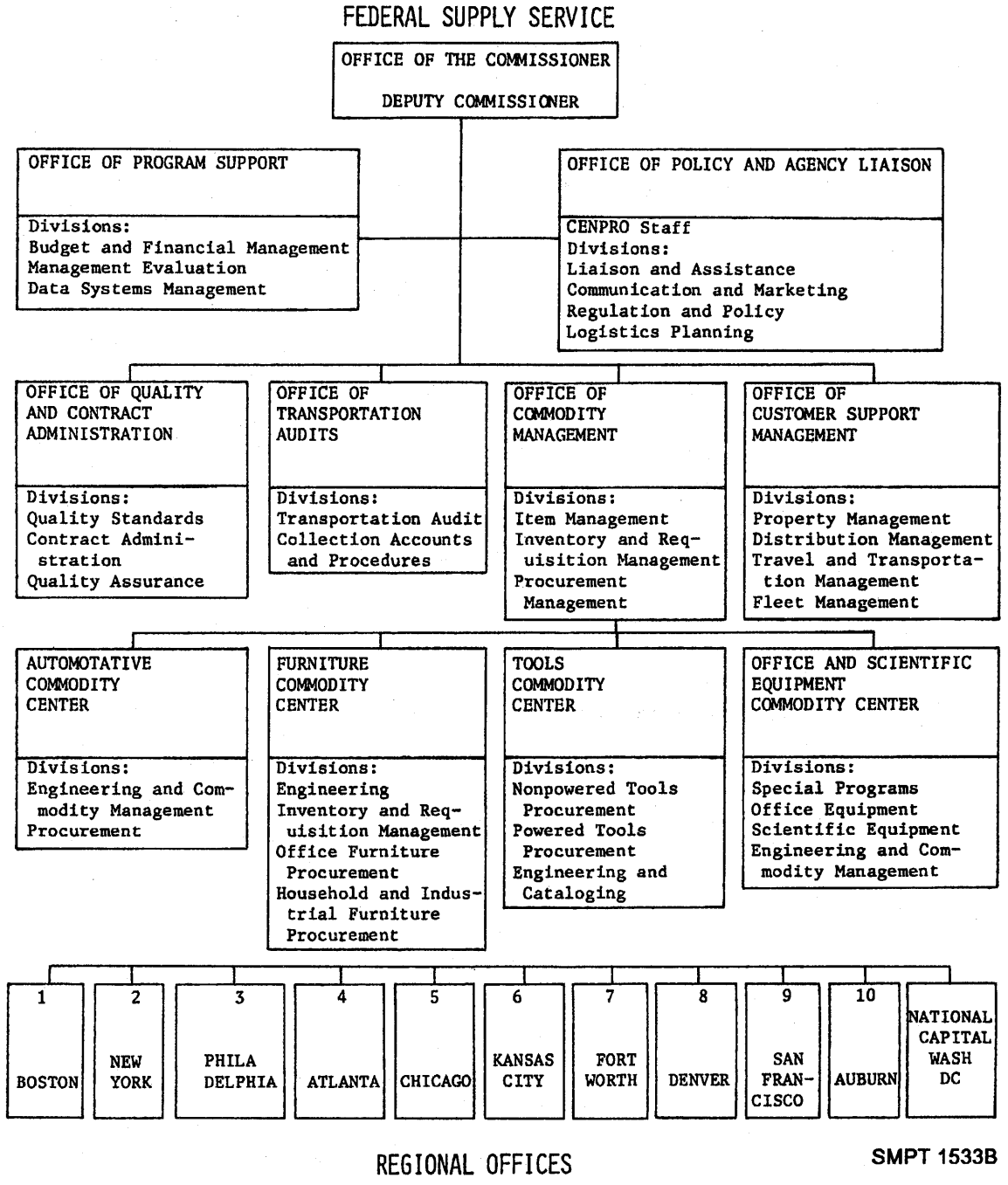


FIGURE 16-2. FSS ORGANIZATION

assigned by Federal Supply Group and Federal Supply Class to our commodity centers.

SUPPORT TO THE MILITARY

BASIS FOR SUPPORT

In 1960, the Department of Defense issued three instructions relative to military activities obtaining materiel from GSA stock or Federal Supply Schedules. The instructions are numbered DODI 4140.5, DODI 4140.7, and DODI 4140.14. The purpose of the instructions is to eliminate duplication in acquisition, to take advantage of large purchase discounts, even though the requisition is for a small quantity, and to centralize stock management of items of supply common to Government agencies.

When this program was first implemented, GSA entered into individual agreements with the single managers, who at the time, had cognizance over particular classes of supply, to jointly review and analyze the Federal Stock Classifications (FSC's) with the intent that GSA would undertake the procurement and stocking of those FSC's which were deemed to be economically advantageous for GSA to manage. After the Defense Logistics Agency (DLA) was established, GSA and DLA entered into a blanket agreement which was expanded so that GSA can assume supply responsibility for an individual item, a family group, or a complete class.

Under terms of this agreement, neither a change in the item nor the dropping of the item from either the Federal or military catalog can be ordered without joint action of DLA and GSA.

It is mandatory for military activities to procure GSA-managed items through GSA unless the required delivery date cannot be met by GSA or by its contractor on the Federal Supply Schedule. In this case the activity can buy directly form any source that can meet its requirements.

GSA has recommended and DLA has accepted management of some classes for all Government needs, where the economics of supply indicate that DLA management is more appropriate.

GSA SUPPORTING PACKAGING

The impact of GSA supply support to DOD in the supply of common items gave tremendous impetus to the Federal specifications program. This program provides the means to ensure adequate quality levels of supply items needed by Federal agencies. It stimulates broad competition and is an important factor in improving the economy of supply operations.

The packaging specialists in each of the commodity centers prepare section 5 (preparation of delivery) of all Federal specifications which are developed in the Federal Supply Service and review this section in all Federal specifications prepared elsewhere.

In the preparation of section 5, GSA includes all the military requirements where appropriate.

GSA also operates storage facilities nationwide. Packaging personnel have been trained in military packaging requirements and conform to those requirements when filling military requisitions.

BENEFITS ACCRUING TO THE MILITARY

The policy of turning over to GSA the procurement and stock management of common civilian-type items used by the military has relieved the DLA and other military procurement offices of an appreciable segment of procurement and supply support and has left them free to concentrate on purely military items.

By consolidating most Government needs into one pool, the mass purchasing power of GSA results in lower item costs and lower costs of procurement and contract administration. Military activities can obtain small quantities of items through GSA at the lowest cost from GSA stock, by ordering directly from a supplier in the Federal Supply Schedule, or through the special order program.

Many duplicate departmental specifications have been eliminated, and differing specifications for similar items have been collated into a single specification through negotiating agreements on slight changes in requirements.

This constant review of Federal specification packaging requirements has revealed many opportunities for package standardization with the resultant benefits of reduced tare weight and cube and lowered costs.

Industry, technical societies, trade associations, and Federal agencies, including the military, participate in the development and coordination of Federal specifications. The program, thus provided, is responsive to the user's supply needs and generates many service and dollar benefits.

FM 38-746
MCO P4030.24D
NAVSUP PUB 539
AFJPAM 24-234
DLAI 4145.6
20 MARCH 1998

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
04390

DISTRIBUTION:

Active Army, Army National Guard, and U.S. Army Reserve: To be distributed in accordance with the initial distribution number 110344, requirements for FM 38-746.

*U.S. Government Printing Office: 1998 - 628-027/80057